Defining characteristics of 21st century

- **Speed** - everything moves faster, changes faster
  - Money, people, products, information, scientific & technological advances, political upheaval, climate change
- **Information** – ubiquitous & growing exponentially
  - Infoglut -- but what’s important?
- **Complexity** - everything is interdependent globally
  - Impact of 4th Industrial Revolution on future of economy, employment, inequality, education, research, ecology
- **Uncertainty** – we are blind to the future
  - 2008 crisis, Brexit, Trump

They pose unprecedented opportunities and challenges
Multidimensional Global Challenges

- **Economic** – rising unemployment, inequality
- **Technological** – disruption from 4th Industrial Revolution
- **Political** – polarization & nationalism
- **Social** – insecurity, violence, extremism
- **Cultural** – tensions, conflicts, fundamentalism
- **Ecological** – resources, pollution, climate
- **Educational** – access, affordability, quality, relevance,

Addressing these challenges requires

Radical changes in
- Public policy
- Institutions
- **Theory**
- **Thinking**
- **Education**
Education is a catalyst and driver for Social Evolution

- Education is humanity’s most powerful instrument for conscious social evolution
- Education transmits to the next generation the essence of knowledge & experience acquired by countless past generations

Paradox of Complexity

- At a time of unparalleled real-world interconnectivity, interdependence and integration, research and education have become increasingly specialized, fragmented and divorced from each other and from the rapidly evolving social context of which they are an inseparable part
- Today more than 1000 subdisciplines are taught in American universities
- Increasingly specialized, compartmentalized knowledge results in increasing ignorance of wider social reality
Educational Generation Gap

- During periods of rapid change, past knowledge is no longer sufficient guidance for accomplishment.
- 50-80% of the jobs that will be created by the 4th Industrial Revolution do not exist today.
- There is a 2-3 generation time-warp between what teachers learned and what students need to learn for accomplishment?

Then what should we be teaching and how?

What employers want? – Google

- Academic performance is a poor index of career success
- The person is more important than degrees, test scores and even knowledge
- Social skills and personality development are essential for collaborative work in the real world
- **Four key qualities** -- Cognitive abilities, Cultural fit, Emergent leadership, Intellectual humility
- Capacity to listen & help his team members advance are core strengths of Google CEO Sundar Pichai

Companies want us to educate the whole person
NEW PARADIGM IN PEDAGOGY

Shift from passive, competitive, subject-centered TEACHING to active, collaborative student/person-centered LEARNING

Shift from the Subject to the Person
Interpersonal variables are 2X as important as institutional variables in learning effectiveness

Hattie-Study: 800 Meta-analysis, 2009 - 2012

**Interpersonal**
- Student-Teacher Relationship
- Peer tutoring
- Feedback and mistakes
- Cooperative peer learning
- Teacher Training

**Institutional**
- Size of classes
- Homework
- Audio-VideoTV
- Technology based learning
- Web-based programs
Power of Personal Attention

- The teacher’s personal attention is more powerful than his/her information.
- Teacher’s personal attention is a powerful determinant of student motivation and performance.
- Observer expectancy
  - Pygmalion Effect – Rosenthal Effect
  - Positive correlation between teacher expectations and student performance.

Active Learning

![Active Learning Pyramid]

- Lecture: 5%
- Reading: 10%
- Audio Visual: 20%
- Demonstration: 30%
- Discussion Group: 50%
- Practice By Doing: 75%
- Teaching Others: 90%

Average Learning Retention Rates

Source: National Training Laboratories, Bethel, Maine
Collaborative Learning – New Technology High, Napa, CA

Schools teach students to work alone and compete. When we hire them, we expect them to work together and collaborate.

Values of NTH

- **Relevant**: engaging, connected, interdisciplinary, real-world, integrated, global, project-based
- **Rigorous**: challenging, comprehensive, open-ended, creative, critical thinking
- **Relationship-based**: personal, collaborative, compassionate, culturally inclusive, respectful, trusting, emotional intelligence, self-managed

Student-Centered 21st Century Schools

62 SC21 Schools in 28 school districts
Stanford University Project 2025
Imagining the future of the university

- **Purpose Learning** – linked to student’s personal learning objectives with their individual mission

- **Axiz Flip** – shift from discipline-specific knowledge to focus on student competencies
  - Departments should become competency hubs
  - **Skill prints** should replace resumes and transcripts

- **Calibration** – short introductory experiences to expose students to range of subjects, learning models, career paths

NEW PARADIGM IN THINKING

The problems confronting humanity today results of the way we think
Analytic Thinking

- Mind divides reality into smaller parts and studies each as if were the whole
- Categorizes everything
- Regards each subject as an independent reality
- Reduces causality to the lowest common denominator

Achievements of Analytic Thinking

- Standard model of the atom
- Periodic table of elements
- Structure of molecules
- Varieties of species
- Genetics of DNA
- Physiological processes
- Computer analysis
- Artificial intelligence
Limitations of Analytic Thinking

- Reduces complex reality to basic constituents
- Fragments knowledge
- Divides related fields
- Constructs models divorced from reality
- Reduces behavior to chemical-electrical impulses
- Reduces human relations to fixed patterns
- Reduces individual uniqueness to general types

Systems Thinking

- Focus on the interconnectedness and interdependence of reality
- Recognizes complexity
- Strives to conceptualize the whole
Achievements of Systems Thinking

- Electric network theory
- Mechanical engineering
- Logic modeling
- Evolutionary biology
- INTERNET

Limitations of systems thinking

- Mechanization of reality
- Reduces conscious human behavior to systems & rules
- Suppresses the subjective dimension of reality
- Suppresses individual differences and uniqueness
Integral, Organic Thinking

- Sees the whole greater than the sum of its parts
- Unifies the objective and subjective dimensions
- Reconciles individuality with collectivity

All knowledge seeks unity

Integral Conceptions

Harmony  Happiness  Health  Personality
Life  Beauty  Peace  Society
Mind  Truth
Geniuses think differently

All great scientific discoveries have involved reconciling apparently separate or contrary phenomena

• Newton unified motion and rest by demonstrating that the same laws govern celestial motions & phenomena on Earth.
• Maxwell unified electricity & magnetism as electromagnetism.
• Einstein unified acceleration and gravity, space & time.

Contradictions are Complements

Common Thought Patterns of Genius

▪ Perceive relations between apparently unconnected phenomena -- Maxwell
▪ See universal patterns repeating across different fields -- Harvey
▪ See profundity in simple facts – Archimedes, Gandhi
▪ Perceive universal truths of life and human nature -- Shakespeare
▪ Envision possibilities long before others can imagine them -- Tesla
Insight & Intuition

- Not dependent on thought forms for knowing
- Emerge when the thinking mind falls silent
- Perceives hidden relationships in ambiguity and paradox
- Reconciles opposites & contradictions within a larger unity

“It is by logic that we prove, but by intuition that we discover.”
— Henri Poincaré

“All human knowledge begins with intuitions, proceeds from thence to concepts, and ends with ideas.”
— Immanuel Kant

Einstein on Intuition

“The intellect has little to do on the road to discovery. There comes a leap in consciousness, call it intuition or what you will, and the solution comes to you and you don’t know why or how.”

“The intuitive mind is a sacred gift and the rational mind is a faithful servant. We have created a society that honors the servant and has forgotten the gift.”
Tapping Human Potential

- French social philosopher Charles Fourier's envisioned a future system of education which would give rise to 37 million mathematicians like Newton, 37 million dramatists like Moliere and 37 million poets like Homer
- We can add to his list 37 million visionary scientists like Tesla

Paradigm Shift in Education

- From passive to active learning
- From competitive to collaborative learning
- From memorizing facts to understanding ideas
- From abstract to contextual knowledge
- From discipline-specific to interdisciplinary studies
- From fragmented thinking to integrated knowledge
- From conformity to creativity
- From academic to life-centered, life knowledge
- From educating the mind to the whole person
- From subject-centered to person-centered
Effective Learning in an Age of Increasing Speed, Complexity and Uncertainty
Roma Tre University, November 16-18, 2017

www.wunicont.org/rome

More Information

- World University Consortium  www.wunicont.org

- World Academy of Art & Science  www.worldacademy.org