

Knowledge, Skills, Behaviors, Attitudes for a Complex World

Let's Rethink the Purpose of Education

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Possible Purposes or Roles of Education

- **Citizenship.**
- **Employability.**
- **More interesting lives.**
- **Release genius that's already there.**

Our challenge is to ensure that we're connected with forces impacting the world...including our own communities.

Gary Marx, President, Center for Public Outreach, Vienna, Virginia

Context

The Sea in Which We are Currently Swimming

Among the Driving Issues We Face Nationally

- **The Economy in General, Deficits, Jobs**
- **Energy, Fossil Fuels vs. Renewables**
- **Environmental Sustainability**
- **International Competition**
- **National Security, Threat of Terrorism, Quest for Self-Determination, Our Role in Geopolitics, Natural and Human Caused Disasters**
- **General Dissatisfaction with Government**
- **Polarization, A Lack of Understanding or Acceptance of What We All Have in Common**

All have implications for education at all levels.

Gary Marx, President, Center for Public Outreach, Vienna, Virginia

Among the Driving Issues We Face in Education

- **Funding. Federal, State, and Local Fiscal Crises and Impact on System-Wide Budgets.**
- **Layoffs. Pension Plans. Future of Unions. Teacher Effectiveness. Teacher Preparation. Pay for Performance.**
- **Immigration, Cultural and Language Diversity.**
- **Poverty. Social and Economic Concerns.**
- **Standards, Testing, Statewide Data Systems/Reporting.**
- **Federal Initiatives, such as Race To The Top.**
- **Time/Expertise to Apply for Federal Grants.**

"The Answer Sheet" Valerie Strauss, Washington Post, Jan. 8, 2010, <http://www.washingtonpost.com>. Other Additions by Gary Marx, President, Center for Public Outreach, Vienna, Virginia

Among the Driving Issues We Face In Education

- **Safety and Security.**
- **Range from Early Education to College Readiness. P-16. Birth-Through Life.**
- **Special Education.**
- **Universal Enrollment in College by 2020.**
- **Enrollment Capacities at 2 & 4-Year Colleges.**
- **Growing focus on Community Colleges: Aims for Student Success, Workforce Development.**
- **Admission Policies and Tuition Prices. Availability of Student Aid/Grant Programs. Often dwindling state support.**

"The Answer Sheet" Valerie Strauss, Washington Post, Jan. 8, 2010, <http://www.washingtonpost.com>. Other Additions by Gary Marx, President, Center for Public Outreach, Vienna, Virginia

Realities for Education

- Expectations will continue to go up, because education is so important to our future.
- Education is a perennial campaign issue and political football.
- The education system is expected to get students ready for a fast-changing world.
- We have a tendency to want to freeze the system in a fast-changing world, leaving the impression that local control means the status quo.

Observations by Gary Marx, Center for Public Outreach

Median Household Incomes by Education Level (2008 Mean)

9 th through 12 th Grade	\$25,321
High School Graduate	\$39,962
Some College (No Degree)	\$50,323
Associates Degree	\$59,163
Bachelor's Degree or More	\$85,127

Table 901. Money Income of Households—Distribution by Income Level and Selected Characteristics: 2008. <http://www.census.gov/hhes/indicators/tables/901.pdf>

Presentation by Gary Marx, President, Center for Public Outreach, Vienna, Virginia, USA

Education for Emerging Ages

Agricultural Age
Industrial Age
Global Knowledge/Information Age
Age of Knowledge Creation and
Breakthrough Thinking

This new age will require skilled and knowledge workers, entrepreneurs, intellectuals, developers of intellectual goods and services, industrial workers, service workers, others.

The size twelve foot will no longer fit in the size six shoe.

Presentation by Gary Marx, President, Center for Public Outreach, Vienna, Virginia, USA

A Few Traditional Ways of Driving the Formal and Informal Curriculum

- Adopting laws or policies requiring that certain things be taught or that time be allocated.
- Mandating standards and high-stakes testing, then teaching to the test--focusing on what's easily tested.
- Cutting budgets for certain people and programs.
- Responding to interest groups, politicians, and economic opportunities or concerns.
- Purchasing curricular programs off the shelf.
- Reviewing studies recommending certain curriculum.
- Defining Expectations. College entrance exams.
- Labeling certain areas of the curriculum as "a nice thing to do if we had the money."

Gary Marx, President, Center for Public Outreach, Vienna, Virginia

Recent Observations

The White House
"Our future depends on reaffirming America's role as the world's engine of scientific discovery and technology innovation. And that leadership tomorrow depends on how we educate our students today, especially in math, science, technology, and engineering."

*President Barack Obama
Announcement on STEM Education, White House, Jan. 7, 2010*

ASCD

"Research has proven that a thriving education system is integral to sustained, long-term economic recovery. Consistent, coordinated planning to ensure that each student is healthy, safe, engaged, supported, and challenged is imperative to student achievement and is even more crucial in times of economic stress."

Gene Carter, Executive Director, ASCD, ASCD Smart Brief, May 12, 2009

Higher Education Official

"With college as an overarching goal, schools focus too much on addressing students' academic deficiencies and too little on building work skills pursued by employers."

James Rosenbaum, Northwestern University, Beyond College for All, 2007, Education Week's Diplomas Count 2009, June 11, 2009

The International Challenge

International Challenges

- Brain Gain vs. Brain Drain (Immigration Issues/Job Opportunities)
- A Global Economy. Understanding the People, Histories, and Cultures of the World. Diplomatic and Language Skills.
- The rise of Asia. China is now the world's leading exporter and largest auto market.
- The population decline in Russia, Europe, and Japan. Frequent gridlock in the EU. Massive adjustments in the Middle East/North Africa.
- In the western world, beginning in the 2020s, aging populations, low birth rates, and a growing need for services may lead to competition among nations to attract the most talented immigrants.

(George Friedman, The Next 100 Years, 2009)
Presentation by Gary Marx, President, Center for Public Outreach

Further Historical Perspective

Plato, Mann, Dewey,
Cardinal Principles, Bloom

Plato's Academy

Located in an olive grove once owned by Greek hero Academus. Plato was an ancient Greek philosopher and educator. Academy founded circa 387 bce.

- Art
- Science
- Literature
- Music
- Astronomy, Biological Sciences, Mathematics, Political Science, Philosophy, and Various Other Intellectual Pursuits
- Socratic Dialogues

Horace Mann

1756-1839

Known as the *Father of Public Education*
First Secretary of Education in Massachusetts, President of Antioch College

- Practical Knowledge
- Moral Elevation and Moral Compass
- Ability to Read and Write
- Aptitude for Mathematics and Science
- A Level Playing Field, Equal Opportunity
- Education as a way to overcome the slavery of Ignorance.

*"Be ashamed to die until you have won some victory for humanity."
Public education is "the great equalizer... the balance wheel of society."*

Progressive Era (1890-1919) Captured and Stimulated by John Dewey

Noted philosopher, psychologist, and education reformer...
the "Father of Progressive Education"

- Articulated a relationship between education and democratic life.
- Believed that investigation, problem-solving, and both personal and community growth were directly connected to sound education.
- Drew from other thinkers about the need for schools to be more child-centered.

The Seven Cardinal Principles

National Education Association's
Commission on the Reorganization of Secondary Education, 1918

- Health
- Command of Fundamental Processes
- Worthy Home Membership
- Vocation
- Citizenship
- Worthy Use of Leisure
- Ethical Character

Thinking of the future, the report stated that education would be driven "by the needs of the society to be served, the character of the individuals to be educated, and the knowledge of educational theory and practice available."

Bloom's Taxonomy Domains of Learning

Benjamin Bloom, Educational Psychologist, University of Chicago, 1956
Also developed ideas around the concept of "mastery learning."

- **Cognitive: Knowledge** (mental skills)
- **Affective: Attitudes** (feelings/emotional areas)
- **Psychomotor: Skills**
(connection between mind and body/manual/physical skills)

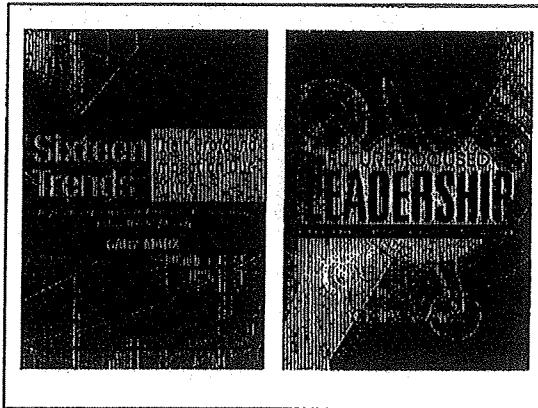
Considerations for 21st Century Future-Focused Education

Framework for 21st Century Skills

Partnership for 21st Century Skills

- **Core Subjects and 21st Century Themes**
Interdisciplinary themes among subjects such as English, reading, language arts, world languages, arts, mathematics, economics, science, geography, history, government and civics.
- **Learning and Innovation Skills**
Creativity and innovation, critical thinking and problem solving, communication and collaboration.
- **Information, Media, and Technology Skills**
ICT/information, communication, and technology literacy, media literacy.
- **Life and Career Skills**

Partnership for 21st Century Skills, www.21centuryskills.org, 2012



**Observations from...
Sixteen Trends...Their Profound Impact
on Our Future**

- All students will be grounded in math, science, and language skills.
- Changes in technology, migration patterns, and demographics will require schools to offer an international focus.
- Students will need to be prepared for careers that don't yet exist.
- All students will need to develop economic literacy, from macro-economics to personal finance.
- Media literacy skills will become increasingly essential.

Sixteen Trends...Their Profound Impact on Our Future, Gary Marx, published by ERG

**Observations from...
Sixteen Trends...Their Profound Impact
on Our Future**

- Ethics will be incorporated at all levels.
- Schools will help students learn across disciplines.
- Students will need to develop teamwork, management, and entrepreneurial skills.
- Schools will cultivate ingenuity, imagination, creativity, and inventiveness. Thinking and reasoning will be seen as basic skills.
- A goal of schools will be to create intellectual entrepreneurs...people who are curious and persistent.

Sixteen Trends...Their Profound Impact on Our Future, Gary Marx, published by ERG

**Ways to Enhance
21st Century Education**

- Active Learning
- Teamwork
- Project-Based Learning
- Real-World Education
- Learning Through Inquiry
- Learning Across Disciplines

Gary Marx, President, Center for Public Outreach, Vienna, Virginia

**What We All Need to Know and
Be Able to Do...to Be Educated
People Who are Prepared for the
Future**

**Twenty Targets
Before 2020**

Somewhat like links in a chain.

*Looking at the big picture.
Starting a conversation about the what and the why.*

**What We All Need to Know and Be Able to
Do to Be Prepared for the Future**

Twenty Targets Before 2020

Communication

- Ability to communicate effectively in at least one language, preferably more.
- Ability and desire to read and comprehend.
- Ability to communicate verbally and/or nonverbally in any setting, across generations.
- Ability to write clearly for a broad variety of media.
- Ability to think, reason, and develop concepts.
- Ability to listen for information and emotion.
- Ability to conduct communication research.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Science

- Becoming science literate, with a firm foundation in life science, physical science, materials science, earth and space science, and the relationship between science and technology.
- Ability to apply scientific methods and principles and engage in scientific research that will contribute to individuals, civil society, the economy, and the ongoing pursuit of knowledge. STEM skills.
- Possess scientific curiosity, a spirit of discovery, scientific inquiry skills. Ability to judge the validity of scientific findings and use the language of science.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Technology

- Technology literacy including proficient use of various technologies to enhance research, quality of life, productivity, communication, information accessing and processing, and problem solving.
- Ability and desire to develop new technologies in areas such as computer science, biology, the environment, transportation, space, and robotics to enhance civil society and the economy.
- Ability and willingness to use technologies ethically and demonstrate technology etiquette.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Mathematics

- Mastery of math concepts, computation, and problem solving skills.
- Ability to use math in everyday life, to apply logic and reasoning in reaching and justifying conclusions, to be functionally and operationally literate, and to understand basics of statistics.
- Ability to communicate in the language of math.
- Being adept in basic math, algebra, geometry, measurement, calculus, statistical methods, probability, and general use of math functions.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Engineering and Architecture

- Understand the significance and scope of engineering and branches of engineering, such as aerospace, chemical, civil, electrical, computer, software, mechanical, nanotechnology, and various combinations in the design and integrity of various structures, machines, materials, and systems.
- Understand the significance and scope of architecture in planning and designing the built environment and complex building systems as well as community designs.
- Recognizing that engineering and architecture careers draw on broad interdisciplinary knowledge.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Thinking and Reasoning

- Ability to engage in critical thinking--to use syllogistic logic, both inductive and deductive reasoning.
- Ability to engage in creative thinking and cultivate the capacity to use lateral thinking, think across disciplines, and develop flashes of insight.
- Mindfulness--including the disciplined mind, the synthesizing mind, the creating mind, the respectful mind, the ethical mind.
- Ability to think big, deal with complexity, learn through inquiry, think philosophically, see things in context, and question current thinking.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Imagination, Creativity, Innovation

- Cultivate the ability and discipline needed to imagine, create, invent, innovate, seek, and discover.
- Ability and willingness to use thinking and reasoning skills, to find relationships among ideas, and to cultivate our own ingenuity and value the ingenuity of those around us.
- Use these skills and qualities in developing self-knowledge and in working with teams, communities, organizations, and nations.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Knowledge Creation/Breakthrough Thinking

- Ability to use analyzing and synthesizing skills, to become adept at thinking and acting across disciplines, and to discover new knowledge, new ideas, and new products, services, or solutions.
- Become an intellectual entrepreneur, seeking new knowledge and moving beyond the status quo.
- Understand that new ideas are often found at the margins and in the white spaces of what we know.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

The Arts

- Understand that our future depends on creativity, imagination, innovation, and our ability to release the genius in all people, stimulated by the arts.
- Develop talents, abilities, and interests in various art forms, such as music, dance, creative writing, drama, painting, drawing, sculpture, photography, video/film/digital, and design.
- Understand that the arts can help us understand divergent subjects ranging from math to history.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Judgment, Ethics, and Character

- Exhibit self-discipline, good character, good will, ethical principles, and act responsibly.
- Exemplify honesty, integrity, and the "golden rule."
- Ability and willingness to balance the expedient and pragmatic with the ethical.
- Act civilly, tempering arrogance and selfish gain with empathy, compassion, and genuine concern about the impact on others of any decision or course of action.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Leadership and Management

- Ability to plan, organize, activate, and to be transparent and accountable.
- Ability and willingness to help people and organizations recognize opportunities or needs and constructively engage them in serving customers or society through a plan or living strategy.
- Ability to work with a team, be entrepreneurial, see things in context, mobilize resources, solve problems, clarify and define, inspire, and stay in touch and adapt to a world of constant change.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Economics and Personal Finance

- People are prepared to create jobs, careers, and industries that may not currently exist.
- Understand the basics of macro- and micro-economic systems and conversant with how they work and might need to change. Proficient in accounting skills.
- Understand income vs. expenses, needs vs. wants, benefits and consequences, affordability, interest, return on investment, value, risk, the lack of guarantees for exponential growth, applied ethics.
- Understanding the link between poverty, educational attainment, and economic potential.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Social and Behavioral Sciences

- Understand our role and civic identity, based in part on people, environment, and events.
- Understand cultures, how they develop, how they are influenced, and how they influence society.
- Grounding in areas such as civics, history, law, political science, economics, government, geography, world affairs, demographics, anthropology, generations, world religions, peace vs. conflict, progress vs. decline, philosophy, community development, roles of citizens.
- Knowledge of behavioral sciences such as psychology and motivation.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Civic Knowledge, Skills, and Dispositions

- Possess civic literacy, including the knowledge, skills, and attitudes needed to be a constructive, contributing member of society.
- Understand Constitutions; how laws are made and changed; rights and responsibilities; authority; and the importance of voting and ensuring fairness, justice, and equal opportunity.
- Develop civic skills to identify issues and problems, conduct research, engage in dialogue, develop solutions/plans of action; and formulate public policy.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Global/International Knowledge and Skills

- Ability to be a connected, world-wise person, grounded in world languages and cultures.
- Reflect diplomatic qualities and skills, such as open minds, natural curiosity, patience, courtesy and good manners, a sense of tolerance, and the ability to put ourselves in someone else's shoes.
- Grounding in economics, history, law, government, political science, civic responsibility, human rights.
- Ability to develop business, governmental, educational, scientific, and personal relationships across political boundaries and cultures.

Gary Marx, President, Center for Public Outreach, Vienna, Virginia

What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Environment & Planetary Security

- Understand that our personal, corporate, and national security depend on planetary security.
- Understand and pursue a philosophy that balances economic growth and development with environmental sustainability.
- Ability to pursue cleaner energy, adequate supplies of fresh water, and availability of nutritious food.
- Understand the need to lift people from poverty and commit to wisely using scarce resources.

Gary Marx, President, Center for Public Outreach, Vienna, Virginia

What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Civil Discourse & The Ability to Overcome Narrowness and Polarization

- Insist on and exemplify a move from polarization and narrowness toward reasoned discussion, evidence, and consideration of varying points of view.
- Demand civil discourse, deliberation, perspective, and pursuit of the common good.
- Insist on a bigger picture rather than simply yielding to narrow self-interests.
- Develop/use reasoning and communication skills.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Health & Well-Being, Life Skills, Work-Life Balance

- Understand and practice good physical and mental health habits, appropriately nourishing, exercising, and strengthening the body and mind.
- Understand the need for medical research, public health, access to health care, avoidance of health risks, and diet. Strengthening the relationship between mind and body.
- Learn and practice basic life skills, such as setting goals, leadership, budgeting, parenting, resilience, conflict resolution, and achieving work-life balance.

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What We All Need to Know and Be Able to Do to Be Prepared for the Future

Twenty Targets Before 2020

Futures Processes & Forecasting Skills

- Become a connected citizen who understands the need to create a sustainable future.
- Use futures tools, such as trend analysis, issue analysis, flexibility/innovation analysis, historic/defining moments analysis, gap analysis.
- Stimulate Imagination in developing goals and considering alternative futures or scenarios.
- Consider political, economic, social, technological, environmental, and demographic forces in society.
- Understand the importance of futures studies.

Gary Marx, President, Center for Public Outreach, Vienna, Virginia

Assignment

What are the purposes of education? Why do we educate people?

We have a tendency to cluster things. That's OK, provided it isn't simply a way to bury a critical need.

When people say...

"We need to teach--or students need to learn _____!"

We need to ask...

"For what purpose?"

Then, we need to ask...

What are we going to do about it?"

We're good at the who, what, when, where, and how, but often come up short on the why.

Gary Marx, President, Center for Public Outreach, Vienna, Virginia, USA

In Developing, Promoting, and Defending Policies, Programs, and Budgets...

Context is Essential

We need to answer the "why" question even before it is asked. We're expected to understand and explain the big picture.

Gary Marx, President, Center for Public Outreach

Our Choice

**We have a choice.
We can simply defend what we have or create what we need.**

Gary Marx, President, Center for Public Outreach