

# Competing on Smarts

The Five Essential Skills Students Need to Succeed in the 21st Century

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## Introduction: The Intelligence Economy

***In the 21st century, every person, enterprise and nation must learn to compete on their smarts. We are transitioning from a knowledge economy to an intelligence economy. Thinking skills trump knowledge in the intelligence economy. High quality thinking skills are a core competency for sustainable success and are at the root of consistently effective problem solving, decision-making and innovation.***

At OneSmartWorld we have created a thinking skills platform for mastering the core competencies needed to succeed in the 21st century. David Naylor, President of the University of Toronto, framed the challenge for educators and leaders. ***“There’s a ruthless global competition underway based on talent and innovation.”*** The winners will be those who can think better, and work smarter, collaborate and innovate faster.

According to recent reports, education in North America has not adapted to the new realities and demands:

***“Canada is no longer preparing students with the background, skills and flexibility to become leaders in the global knowledge economy. Being the most educated, it turns out, may not be the same as the best educated.”***

***“US based employers said graduates under-performed in problem solving and written skills, and abilities such as social intelligence and adaptive thinking.”***

The inequities in our society continue to increase. The widening gap between the haves and the have-nots undermines our ability to innovate and compete. We live in a pluralistic society. We need to level the playing field to give everyone the opportunity to succeed. The single best way to secure the future is to invest in developing the brainpower of our students. We have common languages for speaking, writing, math and music. We do not have a common language for thinking, problem solving and collaborating together.

***“There is no greater resource than the creativity, innovativeness, and productive talents of our people. Our goal must be to harness and use our full creative talents, to grow the businesses and industries of the future...”***

***The Martin Prosperity Institute, Ontario in the Creative Age***

We can achieve success when leaders in education, business, not-for-profits, and government work together to transform both what is learned and more importantly, how learning occurs to nurture the talents of all.

The focus of this white paper is to:

- 1) Map the need for thinking skills and other higher order mental and social skills
- 2) Introduce an integrated thinking skills system as a platform for the intelligence economy
- 3) Show a best practice competency framework of 5 higher order 21<sup>st</sup> century skills
- 4) Propose a high engagement learning initiative to increase engagement and retention
- 5) Engage leaders in education, business and government in a dialogue to make a positive impact

## WHY: The Big Need

*Until the 20th century, educational success was measured by how much one knew. The focus of public education has consistently been on knowledge acquisition. Learn subjects and study for tests. Smart people were the ones who knew the most. The most successful students were those who had the specific skills that matched what education focused on – knowledge acquisition, memory, analytical thinking and retention. Those who were smart in different ways and lacked these skills struggled or left the system.*

There is an increasingly urgent call to shift the emphasis in education from knowledge acquisition to higher order mental and inter-personal skills. Tony Wagner, co director of the Change Leadership Group, Harvard University, author of *Creating Innovators* and *The Global Achievement Gap*, describes the challenge we face:

*“Finally, students need the motivations and dispositions that will enable them to innovate... to learn to work in teams, understand and solve problems using multiple disciplines, persevere, take risks, and learn from mistakes.”*

We live in a world dominated by relentless change, where knowledge is outdated quickly. In the 21st century, with Google, Wikipedia and ubiquitous access to the worldwide web, anyone can acquire the requisite information they need. **Progressive educators are looking for better ways to improve student performance and increase meaningful engagement.** The rigorous focus on test results in secondary and post secondary education and the corresponding failure to build skills in curiosity, critical thinking, reasoning and reflection have left students at a significant disadvantage for coping with the realities of the new world.

The Conference Board of Canada reported that 85% of new jobs now require mental skills rather than physical skills. Parents, employers and the public want to ensure that

students and workers acquire the essential 21st century employability skills they will need to succeed.

***The new smart is how well one can think, self-manage, problem solve, communicate and collaborate.***

Educational leaders in colleges today are under pressure to increase engagement and improve retention. Progressive K-12 leaders know they need to find more effective ways to ensure their students stay in school and complete Grade 12 so they can qualify for work or post-secondary education. The pressure is there to differentiate instruction, increase engagement and to personalize approaches to meet the learning needs of each student. Leaders in business and government know their success or failure depends on access to the highly developed human capital.

***Professor Guy Claxton, Director of the Centre for Real World Learning, University of Winchester, in the UK states:***

*“In the rush to make young people into successful exam-passers, we have overlooked their deeper need to become successful people, eager to learn and grow in the real life world of work, leisure and relationships...”*

*What is the Point of School?*

**Here is a simple schematic to position our work in the current essential skills landscape. There is more detail on how this was arrived at, in the following sections of this paper.**

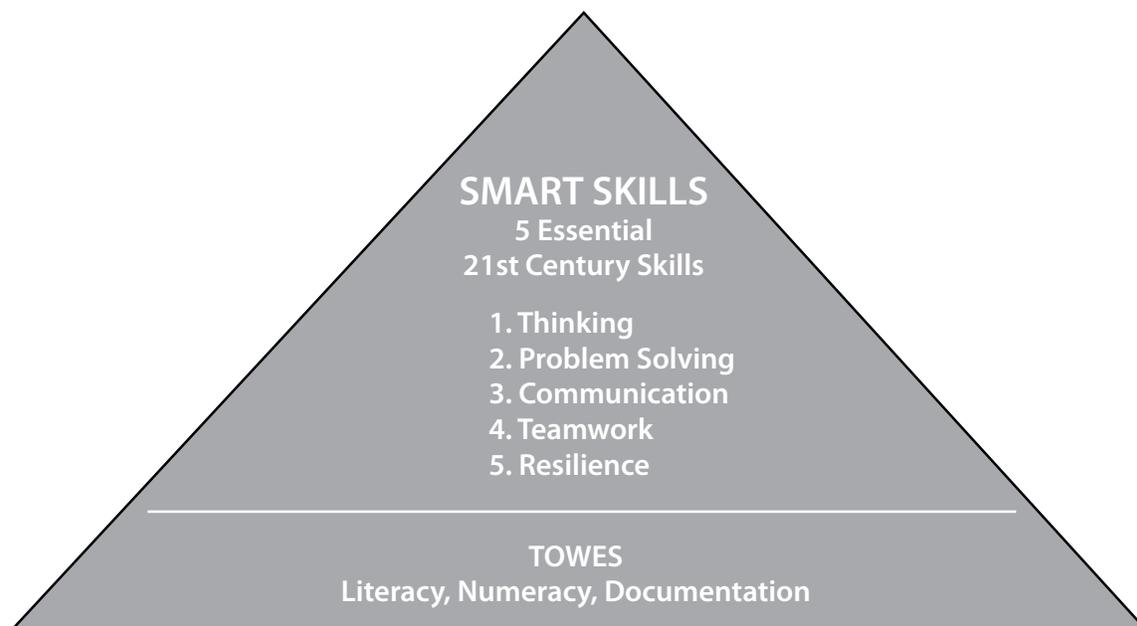
**In a major survey of leaders from a wide variety of sectors in the USA, the Conference Board and the Society for Human Resource Management, the top 5 skills employers are looking for in the next 5 years are: critical thinking/problem solving, information technology applications, collaborative teamwork, creativity/innovation and working with diversity.**

These skills are vital for effective transition to the workplace, to ongoing education and to contributing to the community students live in. In the same survey, employers ranked Mathematics 13th and Science 16th.

**Beyond subject mastery, students need to be more effective thinkers, communicators, creative problem solvers and collaborative teammates.**

As more nations move to foster the development of 21st century skills in their educational systems, we face an ever-greater critical challenge to keep pace. Our students will need the higher order skills to meet the demands of living and working in the global economy and the diverse communities in which they live.

In this paper, we are proposing a thinking skills platform to build 5 essential 21st century skills students and



In a 2012 Workopolis, CIBC and Conference Board of Canada study, 67% of senior executives cited the lack of soft skills – viz. positive attitude, communications, strong work ethic and teamwork – as barriers to growth. Most experts in education and business have been saying the same thing about what the issues, challenges and problems are for educating the 21st century learner. Few innovative solutions have been put forward.

**The purpose of education is to prepare students for the future. Students need more than subjects and content in their curriculum. They need to acquire a new set of 21st century 'smart skills' to help them become more nimble, more adaptive and versatile.**

workforces need to compete from the neck up. It is based on current brain-based research and 12 years of research and development with over 100,000 people in business, education and government.

We have selected the work of three organizations: the Conference Board of Canada, the Government of Canada's HRSDC/Human Resources and Skills Development Canada and the US based Partnership for 21st Century Skills. To address this increasingly urgent challenge, we propose a simple, practical, research-based platform that can enable students to build the requisite higher order skills. The Smart Skills: 5 Essential 21st Century Employability Skills framework is based on an integration of these three primary sources.

The Government of Canada's HRSDC funded Bow Valley College to develop TOWES or the Test of Essential Workplace Skills. TOWES is an assessment of competency that focuses on the core building blocks of literacy, numeracy and documentation. TOWES tests the first three essential skills that provide the basic literacy and numeracy skills to provide entry access to working anywhere. Literacy and numeracy are essential foundations for surviving in the 21st century. However, in the intelligence economy, our educational institutions must go beyond content and deliver the higher order mental, social and emotional skills to equip students with the competitive advantage they need.

**The Smart Skills system we have created is designed to bring together best practices from leading organizations and to provide an integrated platform for teaching the 5 higher order essential 21st century mental and social skills.**

The Smart Skills system begins where TOWES finishes. We have organized the essential employability skills into 5 major themes, based on the original descriptions from the Conference Board of Canada, HRSDC and the Partnership for 21st Century Skills.

## Who: OneSmartWorld's System For Thinking

*OneSmartWorld is a Canadian innovator in human capital and social capital development. We believe that brainpower is the most vital and sustainable resource a person, an enterprise and a nation can possess. We believe that a core function of 21st century education is to develop 4 dimensions of thinking in students – skills in creativity, skills in deep understanding of information, tasks and people, skills in decision-making and skills in building a resilient personal spirit.*

We began in 2000 with the goal to map an inventory of generic thinking skills. After working for over 30 years in this field, we knew quality thinking is a key to high quality results in every domain. **Poor quality thinking consistently leads to poor results. Studies at NASA and the Research Institute of America showed that thinking errors led to 95% of failures in the workplace.** Elizabeth Murray, professor of business at Queen's University attributed 85% of business failures to poor quality thinking by managers. We know effective thinking is a core skill, yet little had been done to make thinking skills understandable and accessible for self-development and for harnessing in a deliberate way by individuals or organizations.

**We wanted to do for thinking skills literacy what letters and numbers had done for literacy and numeracy.**

We wanted to identify the specific thinking skills that lead to quality results We wanted to develop a common language and a system of higher order thinking skills to help people, teams and organizations in business and education achieve superior results.

We were excited by the research into neuro-plasticity that demonstrated intelligence was not fixed at an early age. **The new research showed that intelligence is expandable. Mental skills can be developed throughout a lifetime. Intelligence is multi-dimensional – there are many different ways of being smart. Intelligence is practical and grounded in contexts of solving problems, not an abstract number or concept. Intelligence is also social – it operates best in a supportive caring social climate that celebrates demographic and cognitive style diversity, especially in collaborative teams and groups. The bottom line is that people can get smarter and that thinking skills can be learned, like other skills, with deliberate practice.**

What if we could contribute to a smarter world by creating a single, integrated universal platform for developing people's thinking skills? What if we could build a universal common language for thinking and working together that could help a diversity of people get on the same page together?

## CORE VALUES

These values guided the development of the Smart Skills system.

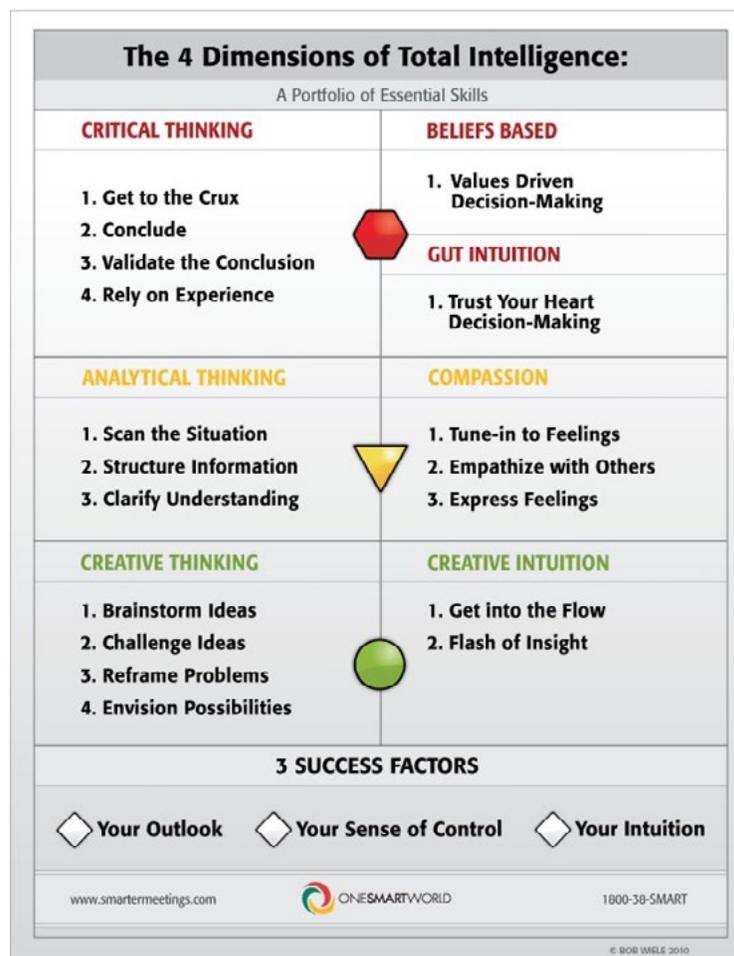
- **Everyone Is Smart And Can Get Smarter:** We believe in the basic goodness and intelligence of people. We believe that everyone is smart in their own way, and, if given the opportunity and the right conditions, everyone can expand their repertoire of thinking skills.
- **Positivity:** We believe positive, affirmative and constructive approaches to people, tasks and challenges result in consistently better results, increased resilience and higher quality relationships.
- **Adaptability:** We believe adaptability is an essential life skill, especially in a world full of disruption and change. The more individuals increase their adaptability, the more likely it is they will succeed.
- **Diversity:** We believe that diversity and especially cognitive style diversity are key success factors in producing superior results from collaborative teamwork and in generating innovation.
- **Cooperative Mindset And Collaboration:** We believe that a cooperative mindset and collaborative approaches to challenges and adversity offer better ways for people, teams and communities to develop high quality solutions.
- **Responsibility For Learning:** We believe that success comes when individuals choose to invest in their own development and take full responsibility for their own learning and progress.
- **Initiative:** We believe that personal and group initiative drives all positive change and innovation. We believe that the more individuals step up and take initiative, the more successful they will be in all their endeavours.

## FIVE DEVELOPMENT CHALLENGES IN DEVELOPING A UNIVERSAL SYSTEM FOR THINKING

### 1. BUILD A SYSTEM AND MODEL FOR THINKING

*The heart of the initiative was to develop a new model for human performance based on thinking not personality. Working with a team of psychologists, we set out to crack the code on thinking strategies and map the generic thinking skills people use to perform four primary tasks – create new ideas, understand situations and other people, make decisions and build resilience.* Part of our original conceptual framework was based on Robert Sternberg's 3 elements of successful intelligence which is also reflected in Jerry Rhodes work on effective intelligence. Using an extensive literature search and scientific research and development on 1000 people, we arrived at a four dimensional thinking skills model – creativity, understanding, decision-making and personal spirit. It was sub-divided into seven cognitive and emotional mindsets with three left brain thinking mindsets and four right brain emotional mindsets. These mindsets are composed of 21 strategies, the precision tools for high quality thinking.

The portfolio of 21 strategies consist of 6 strategies for developing creativity – 4 for creative thinking and 2 for creative intuition; 6 strategies for developing understanding – 3 for analytical thinking and 3 for compassion; 6 for decision-making – 4 for critical thinking and 2 for emotion based decision-making. For personal spirit, the three key success factors are outlook, sense of control and initiative.



## 2. DEVELOP AN ASSESSMENT FOR MAPPING THINKING PREFERENCES TO LEARN THE SYSTEM

In 2000-2001, we developed the 4 Dimensions Inventory or 4D-i as an online assessment for learning. The original instrument normed preferences for using the 21 strategies, on a research population of 956 people. It was re-normed in 2004 and again in 2008, on a research population of 25,000. **The fundamental approach was to combine a 'know self' application to enable people to understand how they are smart, with a 'grow self' application to help make choices on how to expand skills.** The 4D-i gives people a platform to build self-understanding and to target how best to improve their thinking effectiveness and adaptability. It contains an online Coach function to help build skills and planners to consciously develop one's competence in specific strategies. The 4D-i acts like a passport into learning about oneself, for acquiring the common language for managing thinking and for mastering the core strategies in all 4 dimensions.

The 4D-i is used by a variety of businesses, governments, not-for-profits, school boards, community colleges, universities and volunteer organizations to build skills and accelerate collaborative teamwork.

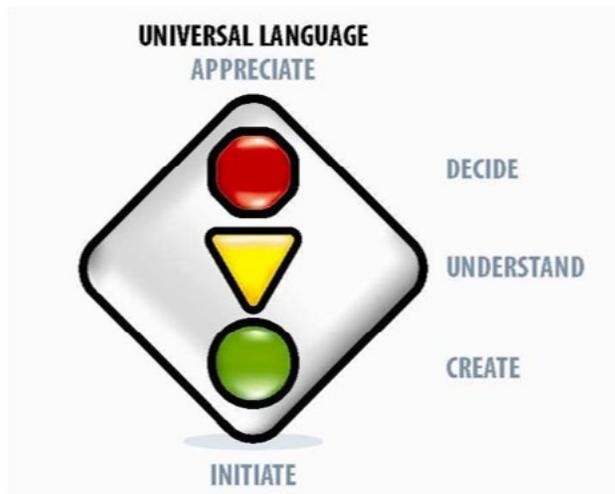
## 3. DEVELOP A GLOBAL UNIVERSAL COMMON LANGUAGE FOR THINKING

**The third challenge was to make the system for thinking simple to learn and easy to use. We needed to design a global common language that would enable a diversity of people to think better and work smarter together.**

Languages act as a short hand to connect people effectively and efficiently. Languages reduce confusion and help people achieve greater clarity. We have many types of common languages from numbers and letters to graphic symbols, facial expressions and traffic lights. In society, languages direct people's attention to help get on the same page together.

In music, the notes act as the building blocks for composing and performing. Once learned, these notes can be used to play everything from chopsticks to hip-hop, jazz and Bach. Numbers are the symbols in the language of numeracy. Once learned, numbers can be used in everything from simple addition, subtraction, multiplication and division to quadratic equations and to map the trajectory to the moon. In literacy, letters and words are the symbols in the language. Once learned, this language can be used to communicate, compose poetry, write everything from headlines to novels and technical manuals.

**More than ever in history, people are paid for the quality of their thinking. Yet no universal language exists for enabling individuals and groups of people to do better thinking and collaborative problem solving together. We designed a set of colours and symbols to formulate a simple, easy to use common language for thinking.**



We based our language on four fundamental dimensions of high performance thinking: creativity, understanding, decision-making and personal spirit. We selected 4 symbols, one for each dimension, and then chose the metaphor of a traffic light to highlight core functions of the mind. This was to make it easier to remember and simpler to use.

**Red zone means stop and decide. Yellow zone means slow down, gather information and understand. Green zone means go and create. White zone means appreciate, empower and initiate.**

This language system of coloured symbols is used to map thinking style preferences and to identify mindsets and types of thinking needed for different types of tasks.

#### 4. ACCELERATE COLLABORATION IN TEAMS

Meetings currently waste billions in lost time, money and talent. Could we use the thinking skills system to help diverse groups of people get onto the same page and work more efficiently and effectively in meetings? **The next challenge was to develop a way to use the common language and strategies to build process tools to help people learn to think better to improve teamwork and accelerate collaboration.** The 4D-i helps map the diversity of thinking styles in a group and build mutual understanding and norms of reciprocity and cooperation. Now what could we do to help people use their total intelligence better in group settings?



We decided to use the colour-coded language as a process-mapping tool. We developed processes we called smart tracks. These are generic thinking process sequences to help teams work through complex problems in a deliberate and disciplined way. This productivity application makes thinking processes and steps visible as pathways to work through conflict management, planning, problem solving and decision-making tasks.

## 5. DELIVER EVIDENCE BY RESULTS

The next development task was to gather evidence that the system worked and produced results. Over the past decade, leaders and teams in education, government and business have selected the system to produce positive change. Here is a short sample of results:

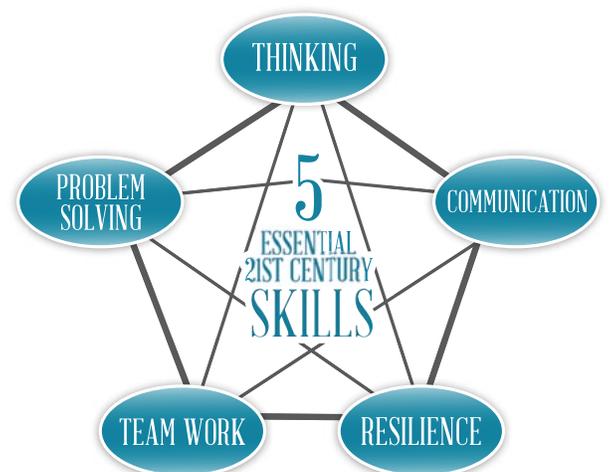
- The 4D-i was the first ever-psychological assessment to be approved for the Government of Canada's SR&ED Scientific Research and Experimental Development program for advances made in measurement science.
- **The 4D-i was selected by the BC government as the best instrument in the world from a pool of 120 assessments and used to develop over 6000 leaders.**
- Businesses and governments at all 3 levels have used it to develop leaders, build teams, reduce waste in meetings and accelerate innovation.
- The 4D-i has been selected by a number of K-12 educational organizations to develop leaders and students including the Texas Education Agency's Catalyst leadership development program, the Alberta School Boards Association's trustee training and school boards in BC, Alberta, Saskatchewan and Ontario. **In a pilot project in Comox Valley, 99% of grade 8 students rated the Smart Skills the most important thing they learned in their school year.** Continuing education students in the Simcoe County District School Board used Smart Skills to complete high school as well as prepare for work and post secondary education.
- In post secondary education, the 4D-i has been selected by Dalhousie University, UBC's Sauder and University of Toronto's schools of business and at community colleges like George Brown, Durham, Centennial, Seneca, Assiniboine, SAIT, College of the North Atlantic- Qatar and North Island.
- **WestJet, Canada's leading airline, achieved a 558% ROI return on investment from saving time by using our smarter meeting process, the highest ROI ever recorded from a corporate training program in Canada.**
- BMO, Bank of Montreal used our RIP IT Rapid Innovation Program to accelerate innovation, build business solutions and executive consensus on critical strategic issues, generating significant new revenues.
- Leading organizations such as Bayer, Boeing, Boys and Girls Clubs of B.C., Cameco, Canadian Cancer Society, Canadian Management Centre, Computershare, Exxon Mobil, Standard Aero, and Workplace Education Manitoba have used the OneSmartWorld system for leadership development, teambuilding and accelerating innovation.

## WHAT: Smart Skills System: 5 Essential 21st Century Skills

*The description of the Smart Skills system that follows and the detailed breakdown of each of the 5 essential 21st century skills, is our synthesis of the consistent pattern of core competencies identified by the Conference Board, the Partnership for 21st Century Skills and the Government of Canada's HRSDC. See Appendix 1 for the complete list of skills and competencies.*

We propose a simple framework for improving and accelerating the delivery of these skills. **We propose the use of the Smart Skills thinking skills system as the unifying framework and integrated system to save time and money to teach these skills. We believe it will make it easier for students to learn and more cost effective for educational institutions to deliver.**

To arrive at the 5 skills, we analyzed the skill sets cited by the Conference Board of Canada, HRSDC and the Partnership for 21st Century Skills. These organizations and others have identified these skills as the core competencies vital for success in the workplace, higher education and in the community.



## 1. THINKING SKILLS

The focus of Thinking Skills is to build capability in 3 core competencies of thinking - creative thinking, analytical thinking and critical thinking. This first skills set provides the foundational platform and the common strategies for acquiring the 4 other skills. This detailed outline incorporates the behavioural objectives identified for this skill set by the Conference Board, HRSDC and the Partnership for the 21st Century.

### CRITICAL THINKING AND DECISION-MAKING

1. Identify the root cause of a problem
2. Readily use science technology and mathematics as ways to think, gain and share knowledge, solve problems and make decisions
3. Elaborate, refine, analyze and evaluate own ideas in order to improve efforts
4. Use various types of reasoning (inductive, deductive, etc.) as appropriate
5. Effectively analyze and evaluate evidence, arguments, claims and beliefs
6. Analyze and evaluate major alternative points of view
7. Synthesize and make connections between information, options and arguments
8. Interpret information and draw conclusions based on the best analysis
9. Make decisions based on crux, logic, practicality and values
10. Evaluate solutions to make recommendations or decisions
11. Check to see if a solution works, and act on opportunities for improvement
12. Reflect critically on learning experiences and processes

### ANALYTICAL THINKING

1. Assess situations and identify problems gathering facts and sensing feelings
2. Seek different points of view and evaluate them based on facts
3. Recognize the human, interpersonal, technical, scientific and mathematical dimensions of situation
4. Plan and organize tasks
5. Decide what needs to be measured or calculated
6. Observe and record data using appropriate methods, tools and technology
7. Make estimates and verify calculations
8. Analyze how parts of a whole interact with each other and the consequences

### CREATIVE THINKING

1. Use a wide range of idea creation techniques – brainstorming, challenging assumptions, reframing, intuitive insights and envisioning possibilities
2. Create new and worthwhile ideas (both incremental and out of box concepts)
3. Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work
4. Demonstrate originality and inventiveness in work and understand the real world limits to adopting new ideas
5. Be creative and innovative in exploring possible solutions
6. Develop and communicate new ideas to others effectively
7. View adversity and failure as opportunities to learn and grow
8. Embrace trial and error, creativity and innovation as long-term, cyclical processes of small successes and frequent mistakes on the way to progress

## 2. PROBLEM SOLVING

The focus of Problem Solving is on developing the 3 core competencies – the behaviours, mental skills, emotional mindsets and specific processes - needed to increase proficiency in solving simple and more complex closed and open-ended problems. This detailed outline incorporates the behavioural objectives identified for this skill set by the Conference Board, HRSDC and the Partnership for the 21st Century.

### PROBLEM DEFINITION

1. Assess situations and identify problems
2. Seek different points of view and evaluate them based on facts
3. Recognize the human, interpersonal, technical, scientific and mathematical dimensions of a problem
4. Use questions to clarify and define the scope and context of a problem
5. Identify the root cause or crux of a problem
6. Reframe a problem and adversity to uncover new opportunities
7. Set desired outcome and write objectives and tasks to achieve the desired outcome

### SOLUTION FINDING

1. Identify and set a bigger purpose at the outset
2. Establish constraints and set criteria to assess solutions
3. Develop phases or steps to come up with a solution
4. Be creative and innovative in exploring possible alternatives and solutions
5. Experiment with conventional and non conventional approaches
6. Readily use research, science, technology and mathematics as ways to think, gain and share knowledge, solve problems and make decisions
7. Evaluate solutions based on criteria to make recommendations or decisions

### DECISION-MAKING

1. Make decisions on the right solution
2. Make a plan on how to implement the solution – include tasks, time frames and responsibilities for who will do what by when
3. Develop and implement a communication plan on the decision
4. Execute and implement solutions
5. Check and validate to see if a solution works, and act on opportunities for improvement

### 3. COMMUNICATION

The focus of inter-personal Communications is to build 3 core competencies in oral and written communication to expand one's capacities to work effectively with other people, especially those who have different operating styles. This detailed outline incorporates the behavioural objectives identified for this skill set by the Conference Board, HRSDC and the Partnership for the 21st Century.

#### WRITE EFFECTIVELY

1. Write to communicate and inform by organizing or recording information
2. Write to request information or justify a request
3. Write an analysis or comparison
4. Write to persuade and convince

#### SPEAK AND COMMUNICATE EFFECTIVELY

1. Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts
2. Ask questions to engage and understand, generate options and assess value
3. Speak so others pay attention and understand
4. Listen and ask questions to understand and appreciate others' points of view
5. Speak to inform and clarify
6. Speak to influence, reassure or persuade people
7. Speak to engage and inspire
8. Speak to instruct
9. Use digital technologies, communication/networking tools and social networks appropriately to access, manage, integrate, evaluate and create information to communicate and successfully function in a knowledge economy

#### CONNECT AND ENGAGE COMPASSIONATELY

1. Listen effectively to others to clarify and paraphrase to decipher meaning, facts, understanding, values, attitudes and intentions
2. Select and switch into the most appropriate mindset, tone of voice, body language and language to engage effectively with the other person
3. Communicate effectively in diverse environments (including multi-lingual)
4. Adapt in the moment to changes in situation, emotions and demands
5. Understand and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments

## 4. TEAMWORK

The focus of Teamwork is to acquire the skills needed to work collaboratively with others, in groups and in teams. There are 3 core competencies. This detailed outline incorporates the behavioural objectives identified for this skill set by the Conference Board, HRSDC and the Partnership for the 21st Century.

### PLANNING SKILLS

1. Determine the real crux of an issue and the purpose of a project or meeting
2. Plan team meetings with clear outcome based agendas
3. Use generic structured planning, problem solving processes and decision-making tracks to develop team thinking plans for agenda items and meetings
4. Plan and design customized, structured planning, problem solving and decision-making processes to develop plans for agenda items and meetings

### PEOPLE SKILLS

1. Demonstrate a consistently constructive, open and flexible approach in dealing with differences, adversity, problems, people and tasks
2. Know when it is appropriate to listen, speak and engage others input
3. Share information, questions, concerns and insights with others
4. Participate and interact collaboratively in all phases of a group's process
5. Use a collaborative language to direct a personal shift and assist a group shift in and out of the different thinking mindsets to match the demands of the task
6. Work with others respectfully and positively in cultures of diversity
7. Use rules of engagement to get on track together and self-monitor personal and group behaviour
8. Leverage differences in diverse groups to help produce new ideas, understandings or solutions
9. Give and receive constructive feedback to continually improve performance

### GROUP MANAGEMENT SKILLS

1. Demonstrate competency in the role of group facilitator
2. Demonstrate competency in the role of group recorder
3. Demonstrate competency in the role of group timekeeper
4. Engage constructively in conflict management and problem solving
5. Adapt to changes and challenges on the spot
6. Use simple tools and cues to engage others and make decisions together

## 5. RESILIENCE

The focus of Resilience is on improved self-management and is based on 6 core competencies and skills. This detailed outline incorporates the behavioural objectives identified for this skill set by the Conference Board, HRSDC and the Partnership for the 21st Century.

### POSITIVITY

1. Demonstrate a positive constructive approach in speaking and behaving
2. Deal with people, problems and situations with honesty, integrity and ethics
3. Recognize one's own and other people's good efforts

### FLEXIBILITY AND ADAPTABILITY

1. Reframe adversity into opportunity and respond constructively to change
2. Deal positively with praise, setbacks and criticism
3. Cope with uncertainty and ambiguity in constructive ways
4. Adapt to varied roles, job responsibilities, schedules and contexts
5. Expand skills and approaches to improve performance

### SELF-MANAGEMENT

1. Understand your own operating style and learning style
2. Set goals and priorities, balancing work and personal life
3. Plan and manage time, money and other resources to achieve goals
4. Assess, weigh and manage risk
5. Be accountable for one's actions and the actions of your group
6. Be socially responsible and contribute to your community

### GROWTH AND SELF DEVELOPMENT

1. Assess personal strengths and areas for development
2. Set own learning and development goals
3. Identify and access learning sources and opportunities
4. Plan for and achieve your learning goals
5. Be willing to continuously learn and grow
6. Learn from mistakes and accept feedback to assist growth
7. Go beyond mastery to expand one's own learning to gain expertise

### SENSE OF CONTROL

1. Work effectively in a climate of ambiguity and changing priorities
2. Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments
3. Be aware of and adhere to personal and group health and safety practices
4. Set and meet goals, even in the face of obstacles and competing pressures

### INITIATIVE

1. Show interest, initiative, perseverance and effort
2. Work independently or as part of a team
3. Be innovative and resourceful in identifying alternative ways to achieve goals and follow up to complete initiatives
4. Demonstrate initiative to advance skill levels towards a professional level

## HOW: The High Engagement Learning Initiative

*This section of the paper proposes some practical ways to shift the focus in the classroom, to engage students in using all 4 dimensions of thinking and build the 5 essential 21st century skills in the higher grades of high school and in post secondary education. As we search for better ways to enable learning for a wide diversity of learners, a good place to start is the research of Carl Wieman, the Nobel Prize winning scientist.*

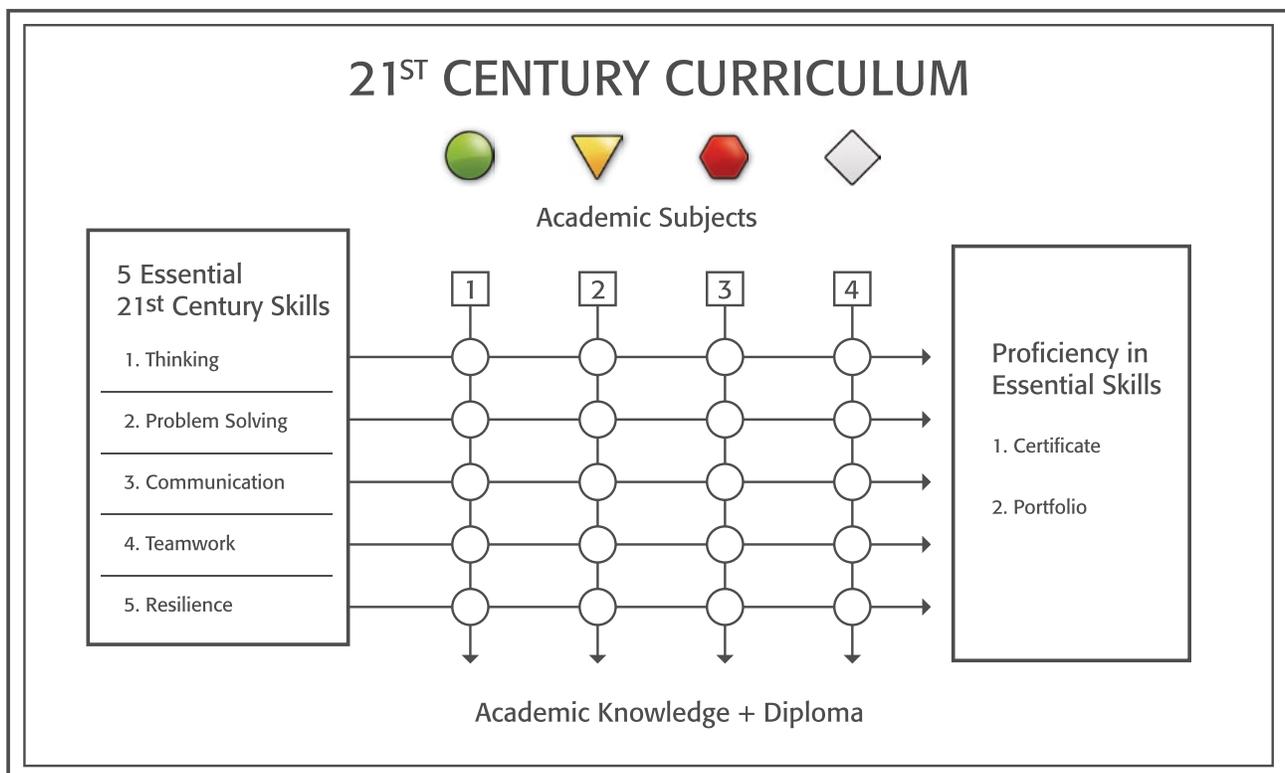
Wieman has headed up the Physics and Science Initiative at UBC and the University of Colorado, as well as serving as President Obama’s Director of Science. Two of Wieman’s recent research projects on learning and teaching, demonstrated that measurable improvement in academic performance can be achieved by using two interventions:

1. **Teach study skills:** The introduction of simple study skills to improve self-organization.
2. **Use group work instead of lectures in class:** The use of group tasks and project based challenges.

We propose a High Engagement Learning Initiative to help transform current classrooms from teacher and teaching-based to learner and learning-based. The HELI focuses on the ‘how’s’ and ‘whys’ of learning to improve the results on the ‘what’s’ that need to be learned. **This approach uses the Smart Skills system’s common language, strategies and processes to shift to a learner-centered, high engagement learning system. It focuses on deciding on the type of thinking the student is doing at each phase of the class design. It contains a clear, deliberate classroom design approach for each lesson plan.** The focus is on engagement and variety of learning activities based on the common platform of the 4 dimensions. This gives educators a new high engagement methodology to build essential 21st century skills while ensuring students acquire knowledge.

The high engagement learning initiative matrix that follows shows how courses can be designed to deliver both the current academic content and build competency in the 5 essential 21st century skills.

### MATRIX



## Start With The Foundations Of Thinking And Problem Solving Skills

**High performers in all walks of life think better. They think differently and they know how to work smarter. The introduction of high engagement learning starts with students acquiring the high performance thinking and problem solving skills at the outset of an academic program.** Introduce these skills in a course and progressively introduce the 3 other essential skills. Help students understand their own potential by sharing the research on brain-based learning, neuro-plasticity, and the discovery that in virtually every domain, it is effort not talent that determines long-term success.

Here is an example of a simple three phase introduction and integration of the platform.

### PHASE 1: LEARN THE THINKING SKILLS SYSTEM

The first phase lays the foundation for understanding how to think and learn. It can be delivered in 4 to 6 hours and provides the learner with the knowledge, skills and tools to increase self-understanding. Students use the 4D-i to acquire a common language to manage their thinking and a portfolio of 21 thinking strategies. **In a classroom environment, it develops an appreciation for others and builds understanding of the diversity of thinking styles and the commonalities that cut across gender, age, ethnic and cultural differences.** Teachers and the educational institutional both get access to in-depth information on each student, to differentiate instruction and to provide individualized coaching and support. In this initial phase, teachers and faculty can introduce what resilience is and how positivity as a life skill can help everyone deal more effectively with set backs and adversity.

### PHASE 2: LEARN PROBLEM SOLVING SKILLS

**The second phase introduces the use of the same common language and mental strategies as thinking process elements for individuals and groups to problem solve and work together better in group tasks.** It provides simple templates and tools for group project work. Students learn to design sequenced smart tracks for thinking things through. In this phase, students learn goal setting, time management and problem solving process management.

### PHASE 3: INTEGRATE THE THINKING AND PROBLEM- SOLVING SYSTEM INTO ALL TEACHING AND LEARNING

**Once the common language for thinking is acquired, teachers can use it like a mental traffic light, to direct student attention to the type of thinking required for the task and shift focus to the different zones e.g. – be yellow analyze data, red to critique or validate an argument or green to generate ideas or envision possibilities.** The essential skills of communication, teamwork and resilience can be developed by ensuring students spend a minimum of 50% of their class time in deliberately structured group work - in pairs, in triads, small groups and home teams. The use of the problem solving tracks builds teamwork skills and can be used in short 2-3 minute exercises as well as being used as templates for structured group work in small and large projects.

### RETURN ON INVESTMENT

**The investment in building essential 21st century skills at the outset of a learning semester will yield 3 dividends.** First, it will equip students with the essential skills they need to succeed. Second, it gives teachers a new cross-curricular methodology for planning and facilitating high engagement classes. Third, it will increase retention. It will empower students with the higher order thinking skills they need to manage the demands of advanced learning. It will build greater student confidence to engage, learn and contribute while building stronger relationships among the diversity of students in the class.

## 5 Design Guidelines For Implementing High Engagement Skills Learning

**Michael Fullan, one of the world's foremost authorities on educational reform, said that at the heart of change "learning is the work." Given the pace of change, learning is the lifetime work for students and the rest of us.**

Adaptation is a core life competency. The Smart Skills system gives students their own set of navigational tools to adapt and find their way. In his book, ***Motion Leadership***, Fullan highlighted a set of guiding principles for guiding change. These include: First build relationships - engage, listen, respect and work with people. Beware of fat plans – keep it skinny, try stuff out and get to action sooner. Behaviour before beliefs – try it before you like it and learn while doing with peers. Communicate, communicate, communicate - especially during the early implementation phase to learn, correct and adapt on the fly. Finally, it's okay to be assertive and take risks. Without initiative, nothing will move forward.

**The Smart Skills system adds a new layer to curriculum design and the classroom learning experience. The focus is on improving how each student thinks and operates, while carrying out the need to increase what they know. Students and teachers could obtain certificates for demonstrating proficiency in each of the 5 Smart Skills.**

Here are 5 design principles to implement high engagement learning.

**1. ENGAGE LEADERS, FACULTY AND TEACHERS IN CO-DESIGNING AND TRYING IT OUT** – Engage teaching staff in learning the Smart Skills system and then in designing and delivering their own high engagement learning experiences.

### 2. FOCUS FIRST ON THE INTENDED THINKING

**OUTCOMES** - Design class work according to what type of thinking the student is expected to use while in the class.

Use these 7 types of thinking outcomes to guide course, class, assignment and learning activity design:

-  Creative Thinking - develop possible solutions and options, brainstorm ideas, reframe problems into opportunities, challenge assumptions
-  Imaginative Thinking – create imaginative ideas, insights or out of the box type of solutions or scenarios
-  Analytical Thinking – describe what you know – facts, knowledge, analysis, plan, blueprint and organize to present, clarify data for accuracy
-  Compassion – describe and demonstrate how you can read emotional cues, detect different mindsets to match the needs of the other; demonstrate acceptance of differences
-  Critical Thinking – identify the crux of a problem, come to conclusions, make decisions and provide evidence to support the conclusions or arguments, use experience from others.

 Emotion-Based Decision-Making - express what you believe is the right thing to do, trust and discuss your own gut instincts

 Personal Spirit – demonstrate appreciation and positive approaches, demonstrate action and how to take initiative

**3. ENSURE 20% OF TIME ALLOCATED FOR EACH OF THE 3 TYPES OF THINKING SKILLS** - Ensure each class engages students in a variety of thinking work with a minimum of 20% of time allocated to creative thinking work, 20% to building understanding and 20% to critical thinking.

**4. USE A 60/20/20 CLASS DESIGN PRINCIPLE** - Aim for an overall class time ratio of 60% of time allocated to disciplined group work, 20% to dialogue and 20% to teacher presentation.

**5. EVALUATE PERFORMANCE BASED ON A 50/50 RATIO - 50% ON THE WHAT AND 50% ON THE HOW** - Evaluate student performance with 50% of value on what was learned and 50% on how it was learned. Have students produce evidence of their use of specific thinking strategies and the thinking processes used to arrive at results.

## NOW WHAT, NOW WHO: Conclusions

*Life in the intelligence economy will be increasingly relentless and unforgiving. We will need to equip our young people to compete from the neck up. Thinking skills are essential for sustained success and achievement. Thanks to the new understanding of the brain's neuro-plasticity, we know now that the 5 Smart Skills, like other skills, can be developed with deliberate practice.*

Human intelligence is the spark for innovation. A mind is a terrible thing to waste. A failure to ensure that students acquire the essential 21st century skills will have a negative lifelong impact on their lives. It will be a significant barrier to our nation's ability to compete in the global economy.

For years now, experts have cited the litany of problems we face in properly preparing students for the future. Everyone knows the need to prepare our students better for the realities of the new workplace. Countries and enterprises need to build a base of human capital that can innovate with the best in the world.

***Given the diversity of our society, we need to find more effective ways to help people from different backgrounds acquire these skills. We need to find better ways to understand each other and to get on the same page to work collaboratively together. We need a common language and a practical skill set to develop the essential 21st century skills in thinking, problem solving, communication, teamwork and resilience.***

It is our belief that the Smart Skills system offers a positive way to integrate the higher order essential skills into the educational curriculum to build self-efficacy within students and secure our long term future in the global society.

We need more initiatives that help to build a smarter, better world. It's time for leaders in education, business and government to become more engaged in finding innovative ways to equip their students with the essential skills they need to succeed in the 21st century. We invite you to contact us to explore how we can support your goal to meet the challenges ahead.

***Let's connect 800-38-SMART, bwiele@onesmartworld.com or info@onesmartworld.com***

## ABOUT BOB WIELE

Bob Wiele is president of OneSmartWorld Inc and the inventor of the 4D-i, the Smarter Meetings platform and the Smart Skills system for 21st century education. He is a relentless innovator. Bob is committed to developing practical solutions that help people, teams and organizations produce remarkable results by learning how to think better and work smarter together. He is the author of *Smart for Life* and a suite of workbooks and papers that focus on thinking skills development, meeting productivity, collaborative teamwork and innovation.

## ABOUT ONESMARTWORLD

OneSmartWorld is a Canadian-based, human capital development organization that helps progressive leaders in business and education unleash creativity, accelerate collaboration and spark innovation to achieve superior results. Our clients save time and money by using the power of one integrated platform to develop their leaders and build high performance teams. They use our system and our team members to find innovative ways to work smarter, increase engagement and reduce time wasted in meetings. OneSmartWorld's solutions are built on our original research and development into the thinking styles of over 100,000 people, the latest findings in brain-based learning, collaborative teamwork, positive organizational psychology and decades of proven business results with our clients.

The Smart Skills system is a global movement to transform the lives of individuals, teams and organizations, by teaching a universal common language to improve skills in thinking, problem solving and collaboration. The Smart Skills system provides practical knowledge and simple tools to help develop resilience, increase appreciation for diversity and improve the quality of relationships among people.

## Appendix 1: Sources For The Smart Skills

### The Conference Board of Canada

According to the Conference Board of Canada, the Employability skills 2000+ are the critical skills you need in the workplace – whether you are self-employed or working for others. Developed in 1990 by the Conference Board and updated over the past decade, the Employability Skills 2000+ has been a vital framework for educators and employers. The core skills include communication, problem solving, positive attitudes and behaviours, adaptability, working with others, and science, technology and mathematics skills. The skills are organized into three sets, with a total of 11 skills and 56 behaviours:

#### Fundamental Skills

Communicate – includes oral and written communications

Manage information – records, stores, accesses information properly

Use numbers – strives for accuracy, measures, estimates and budgets

Think and solve problems – resolves problems, asks for help, makes decisions

#### Teamwork Skills

Work with others – supporting others, accommodating diversity, leading and following

Participate in projects and tasks – focus on making a contribution, helping out and accepting help from others

#### Personal Management Skills

Demonstrate positive attitudes and behaviours – shows initiative, respects, acts positively

Be responsible – finishes work, avoids time wasting, shows up on time, ready to work

Be adaptable – open to change and new ideas, takes on new workplace assignments

Learn continuously – engages in new challenges, learns from mistakes, stays current

Work safely – puts safety first, follows safe procedures

The Conference Board of Canada invites and encourages students, teachers, parents, employers, labour, community leaders and governments to use Employability Skills 2000+ as a framework for dialogue and action. They believe that understanding and applying these skills will help students enter, stay in, and progress in the world of work. Employers use the skills to hire and train employees. School boards and colleges have used the Employability Skills 2000+ for the past decade to guide curriculum development.

## HRSDC Essential Skills

Through extensive research, Human Resources and Skills Development Canada (HRSDC) and other national and international agencies, identified and validated a list of 9 Essential Skills that people need for work, learning and life. According to HRSDC, they provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change. These skills are used in nearly every occupation and throughout daily life in different ways and at different levels of complexity. Their nine Essential Skills include:

**Reading Text:** Refers to reading material that is in the form of sentences or paragraphs. Generally involves reading notes, letters, memos, manuals, specifications, regulations, reports or journals.

**Document Use:** Refers to tasks that involve a variety of information displays in which words, numbers, icons and other visual characteristics are given meaning by their spatial arrangement. For example, graphs, lists, tables, blueprints, schematics, drawings, signs and labels are documents used in the world of work.

**Numeracy:** Refers to the workers' use of numbers and their being required to think in quantitative terms.

**Writing:** Includes writing texts and writing in documents, non-paper-based writing.

**Oral Communication:** Pertains primarily to the use of speech to give and exchange thoughts and information by workers in an occupational group.

**Working with others:** Examines the extent to which employees work with others to carry out their tasks. Do they have to work co-operatively with others; do they have the self-discipline to meet work targets while working alone.

**Continuous Learning:** Examines the requirement for workers in an occupational group to participate in an ongoing process of acquiring skills and knowledge.

**Thinking Skills:** Differentiates among five different types of cognitive functions. However, these functions are interconnected.

**Computer Use:** Indicates the variety and complexity of computer use within the occupational group.

## The Partnership for 21st Century Skills

The Partnership for 21st Century Skills has emerged as the leading advocacy organization of its type in the US. It is focused on infusing 21st century skills into education. The organization brings together the business community, education leaders and policymakers to define a powerful vision for 21st century education. Its intent is to ensure that students emerge from our schools with the skills needed to be effective citizens, workers and leaders in the 21st century.

The Partnership for 21st Century Skills believes that there is a profound gap between the knowledge and skills most students learn in schools and the knowledge and skills they need in typical 21st century communities and workplaces. The 21st century skills are a key to improving the nation's competitiveness.

Schools must align classroom environments with real world environments by infusing 21st century skills into their teaching and learning.

The Partnership has identified six key elements of a 21st century education, which include:

**Core subjects:** English, reading or language arts; mathematics; science; foreign languages; civics; government; economics; arts; history; and geography.

**21st Century Content:** Several significant, emerging content areas are critical to success in communities and workplaces. These content areas typically are not emphasized in schools today: global awareness; financial, economic, business and entrepreneurial literacy; civic literacy; health and wellness awareness.

**Learning and Thinking Skills:** Comprised of: critical thinking and problem solving skills; communication skills; creativity and innovation skills; collaboration skills; information and media literacy skills; contextual learning skills.

**ICT Literacy:** Information and communications technology (ICT) literacy is the ability to use technology to develop 21st century content knowledge and skills, in support of 21st century teaching and learning.

**Life Skills:** include leadership, ethics, accountability, adaptability, personal productivity, personal responsibility, people skills, self-direction, social responsibility.

**21st Century Assessments:** The essential foundation of a 21st century education. A balance of assessments, including high-quality standardized testing along with effective classroom assessments, offers students a powerful way to master the content and skills central to success.

*For an excellent overview of the Partnership's work, see 21st Century Skills, Rethinking How Students Learn, edited by James Bellanca and Ron Brandt and published by Solution Tree, 2010.*