



## Where are we headed, and what is guiding our way?



### OECD directions... a *best bet* for 21<sup>st</sup> century learners

#### Background... a global view

A number of OECD publications are deeply informing directions for global education. *In one publication, Education Today 2010*<sup>1</sup>, the authors state that **21<sup>st</sup> century skills are seen as fundamental to innovative and creative societies** (p.79). They outline findings from aspects of the research and innovation work of the OECD in education that includes: educational R&D systems, knowledge management, futures thinking, and evidence-informed policy and practice. These key findings state:

**For a person, organization, economy or society to be innovative requires wide-ranging skills, including “soft skills”, making it a priority to ask how effectively education systems foster them:** Innovation covers a wide range of activities from invention and breakthroughs, to implementation and minor improvements. It therefore necessitates a wide variety of skills:

- **Basic skills and digital age literacy:** These include reading, writing, numeracy, and the skills to use digital technology, and to access and interpret information.
- **Academic skills:** Associated with disciplines such as languages, mathematics, history, law, science, these skills are generally obtained through the education system and are transferable across different situations.
- **Technical skills:** The specific skills needed in an occupation, which may include both academic and vocational skills, as well as knowledge of certain tools and processes.
- **Generic skills:** Skills of this sort commonly are seen to include problem solving, critical and creative thinking, ability to learn, ability to manage complexity. A skill such as problem solving may be considered as transferable, but some argue that it is also firm-specific.
- **“Soft” Skills:** These include working in teams and heterogeneous groups, communication, motivation, volition and initiative, the ability to read and manage one’s own and others’ emotions and behaviours, multicultural openness, and receptiveness to innovation.
- **Leadership:** Related to “soft” skills, these include team building and steering, coaching and mentoring, lobbying and negotiating, co-ordination, ethics and charisma.<sup>2</sup>

Schools are conventionally poor at using the key motors of innovation – research knowledge, networking, modular restructuring, technological advance: OECD work has identified four key “pumps of innovation”:

- The “science-based” innovation pump: **Education has not traditionally made enough direct use of research knowledge**, and there is often cultural resistance to doing so. This is increasingly being targeted in reform.
- The “horizontally-organised” innovation pump: There are obvious **benefits in terms of teachers pooling their knowledge through networks**, but incentives to do so remain underdeveloped. There is need to tighten the “loose coupling” between single teachers, individual classrooms and individual schools that so characterize school systems.
- The “modular structures” pump: This is about **building complex processes from smaller sub-systems that are designed independently**, but function together. Education is accustomed to working in modules, but much of it involves schools or teachers operating separately from each other.
- The “information and communication technologies: (ICT) pump: **There is powerful potential for ICT to transform education**, but its use in schools remains underdeveloped, partly because the main modus operandi of school administration and instruction are resistant to change.<sup>3</sup>

Recognition of the key role of research and knowledge management in educational practice and policy management has been growing, but still tends to be weakly developed.

**In many countries, there has been only limited capacity to develop and exploit the knowledge base on which improved practice and effective policies can be based.** The volume of relevant educational R&D tends to be generally low, despite education being so explicitly about knowledge. Similarly, a great deal of educational change is still shaped by short-term considerations despite education’s fundamental long-term mission and nature. **Pre-occupation with pressing immediate problems or simply seeking more efficient ways of maintaining established practice... is increasingly problematic in meeting the challenges of complexity and change.**<sup>4</sup> To busy educators, working toward long-term missions feels like re-tooling or building a plane in flight. A short clip on YouTube, *Building a Plane in Flight*, gives you the feeling.

**In recent years, greater emphasis has been placed on the development and use of evidence in teaching.** Educational research based on methodologies for measuring causal impacts has grown and increased the body of available knowledge. New links with neuroscience

are also promising... the enhancement of educational research will remain a serious challenge in the years to come, and developing necessary evidence will require further work... Insufficient evidence that an educational innovation represents a significant improvement over traditional or mainstream practices hinders the demand for innovation... **measurement and evaluation of educational change and innovation will be essential to unleash innovation in education.**<sup>1</sup>

Again, this is music to my ears as our action research work over the past 25 years has been about investigating a challenge, designing approaches based on study of the literature, implementing the approaches, analyzing and reflecting on the findings and starting anew. In 1999 when the OECD outlined global standards for proficient reading<sup>5</sup>, I remember the puzzled looks on the faces of teams of action researchers from fourteen B.C. school districts when I introduced a summary of the directions on a slide:

#### **Global Standards Drive Practice**

The new international standards for proficient reading require that students think about what they read, explain or describe their thinking. These new literalism are moving closer to proficiencies that mark a person as literate. Demonstrations of thoughtful literacy require readers to be able to consider, discuss and talk about their understandings of text, and also about the various processes of reading... classroom talk around a range of texts is critical to becoming thoughtfully literate. Students need many opportunities to interact with text, with partners and with ideas presented to the whole class... explaining connections, summarizing, analyzing, interpreting and evaluating ideas.<sup>5</sup>

The study and cycles of action research that followed led to the development of the *SmartLearning* framework as we know it today. The **Connect•Process•Transform•Reflect cycle** has gone through many refinements since its inception in the mid-90's, and now combined with the host of skill-specific *BrainSmart* thinking tools, serves as a model for developing important 21<sup>st</sup> century skills in all learners.

You can imagine my delight when I received the OECD publication, *The Nature of Learning: using research to inspire practice* (November, 2010). Two leading researchers presenting at the fall, 2010 BCSSA conference in Victoria, mentioned the resource. I was able to access the document on-line and after only reading the executive summary in the airport, I gave out what I thought was a private little cheer. A person sitting near me, waiting to board a plane, asked, "What is making you so happy?" I didn't want the person's eyes to glaze over, so I said, "What we have been working on for over 25 years, is now suggested as a global goal for education!"

He of course asked, “What is the global goal for learning across the globe?” I smiled and asked, “What do you predict countries across the globe would want to see in their learners, their citizens of tomorrow?” He thought for a moment and then talked about the need for deep understandings of complex problems and having ways to collaboratively tackle them. He also mentioned initiative, determination, an open mind, and perseverance... Bingo! He added that skill with communication -- the ability to collaborate, to speak articulately, to read deeply, and to write fluently for different reasons -- is a must.

I read him the seven conclusions on learning, one by one, and we had a delightfully hopeful conversation – all in the fifteen minutes we waited to board our respective planes:

### 1. What is the global goal for education... from the OECD perspective?

- p.14..... many scholars now agree on the key importance for organizations and policy to develop in learners **“adaptive expertise”** or **“adaptive competence”**, i.e. The ability to apply meaningfully-learned knowledge and skills flexibly and creatively in different situations

One quote stands out as a corker, *“The learning environment recognizes the learners as its core participants, encourages their active engagement and develops in them an understanding of their own activity as learners ... A learning environment oriented around the centrality of learning encourages students to become ‘self-regulated learners.’ This means developing the ‘meta-cognitive skills’ for learners to monitor, evaluate, and optimize their acquisition and use of knowledge... “*

I literally thought, ‘our time has come’. This has been our work for over 25 years! When I read that the educational agenda may be characterized as: *learner-centred, structured and well-designed, profoundly personalized, inclusive, social...* I felt so validated and so grateful for the time we have spent developing and refining the *SmartLearning* system of practice.

**Note:** a summary of the OECD directions are outlined in the spring 2011 update:  
[www.smartlearning.ca](http://www.smartlearning.ca)

### 2. Why is adaptive competence so important?

- **Adaptive competence ... involves the willingness and ability to change core competencies and continually expand the breadth and depth of one’s expertise** (Bransford et al, 2006). It is fundamental, indeed necessary, to acquiring the ability to transfer one’s knowledge and skills to new learning tasks and contexts (De Corte, 2007; Hatano and Oura, 2003). It follows that adaptive competence is central to lifelong learning.

### 3. How do we use relevant research findings in a coherent way as a foundation for the design of learning environments for the 21<sup>st</sup> century?

- p.14... We now have...a body of...relevant research findings ...that provide a powerful knowledge base for the design of learning environments for the 21<sup>st</sup> century.
- p.56...The aim should be to elaborate **a more thorough explanatory theory of the learning processes that facilitate and enhance the acquisition of ‘adaptive competence’**.

**Note:** Through over 25 years of action research, *SmartLearning* has evolved as a research-based and research-proven approach designed to develop important skills and meta-cognitive processes in all learners – regardless of background, needs or skill levels. The sets of processes, called **BrainSmart Tools... powerful pathways for personalizing 21<sup>st</sup> century learning** (in progress)<sup>6</sup> are thoughtful learning strategies designed to develop complex 21<sup>st</sup> century competencies:

- p.23... Higher-order thinking skills
  - Generate, process and sort complex information
  - Think systematically and critically
  - Make decisions weighing different forms of evidence
  - Ask meaningful questions
  - To be adaptable and flexible to new information
  - Creative
  - Identify and solve real-world problems
  - Acquire a deep understanding of complex concepts
  - Gain media literacy and the ability to use advanced information technologies
  - Teamwork, social and communication skills

Together with the *SmartLearning* framework, the ‘*brainsmart*’ tools provide educators with learning processes that ‘*facilitate and enhance the acquisition of adaptive competence*’ – if they are developed systematically through cycles of learning lead to higher understandings and lasting learning (**H•U•L•L**) with the whole class; if learners are guided to apply their understandings to ‘*just-right texts*’ of choice (**M•A•S•T**) during independent reading, and to independent inquiries or disciplined explorations of matters of substance during personal investigation times (**S•A•I•L**). All phases of learning are supported by WordWork, a *brainsmart* approach to the development of vocabulary and orthographic knowledge. Through the systematic interactions inherent in the sailing-

metaphor model, learners become very aware and highly skilled at mindfully monitoring and self-regulating their own learning.

Note: See the full sailing-metaphor model at the end of this paper.

- *The SmartLearning* approach stands on a powerful knowledge base, as a way to equip learners with learning processes that facilitate and enhance the acquisition of '*adaptive competence*'.

#### 4. What are the implications for learning processes to best acquire adaptive competence?

- Considering *adaptive competence* as such a key goal has **important implications for the learning processes to best acquire it**. An important component of adaptive competence consists of skills in self-regulating one's own learning and thinking.
- ...novel classroom practices and cultures are needed to **create the conditions for a substantial shift from guided learning (teacher-directed) towards action and experiential learning**, resulting in a balanced, integrated use of these three ways of learning in order to support the progressive acquisition of *adaptive competence*.

Such a balance should allow for structure and guidance by the teacher where and when needed, and it should create space for substantial self-regulated and self-determined student learning. It should also leave open opportunities for what Eisner (1994) has called '*expressive outcomes*', *i.e. unanticipated results from incidental learning in a variety of situations such as a museum, a forest, etc.*

**Guided learning:** a trainer or teacher decides about the goals of learning, the learning strategies, the ways to measure outcomes and (s)he takes care of feedback, judgments and rewards (Simons, van der Linden and Duffy (2008b).

**Experiential learning:** is not controlled by the teacher and has no pre-determined objectives. What is learned is determined by the context, the learner's motivation, others with whom the learner is in contact, discoveries made, etc. What is acquired is a by-product of the activities in which one is involved.

**Action learning:** invites the learner to play a much more active role in determining the objectives of the learning and it is largely self-organized and self-planned.

#### 5. What is required to develop adaptive competence?

**Building adaptive competence** in a domain requires acquisition of several cognitive, affective and motivational components (De Corte, 2007; De Corte, Verschaffel and Masui, 2004):

- **A well-organized and flexibly accessible domain-specific knowledge base involving facts, symbols, concepts and rules** that constitute the contents of a subject-matter field.
- **Meta-knowledge** involving, on the one hand knowledge about one's cognitive functioning or "meta-cognitive knowledge" (e.g. believing that one's cognitive potential can be developed through learning and effort, and, on the other hand,

knowledge about one's motivational and emotions that can be actively used to improve learning).

- **Self-regulatory skills**, regulating one's cognitive processes (meta-cognitive skills or cognitive self-regulation, e.g. planning and regulating one's problem-solving or learning processes); and skills regulating one's volitional processes (motivational self-regulation, e.g. maintaining attention and motivation...).
- **Positive beliefs about oneself as a learner** in general and in a particular subject, about the classroom or other context in which learning takes place, and about the more specific content within the domain.

## 6. What does the learning need to be like?

- **School learning needs to be more ambitious...** it should be active/constructive, cumulative, self-regulated, goal-directed, situated, collaborative, and permit individually different processes of meaning construction and knowledge building (De Corte, 1995;2007; Shuell, 1988; Mayer, 2001; National Research Council, 2000).
- Simons et al. (2000b) identify an even more extended list: **the shift toward action learning, on one hand** requires more active, more cumulative, more constructive, more goal-directed, more diagnostic and more reflective learning; **the shift towards experiential learning, on the other hand** requires more discovery-oriented, more contextual, more problem-oriented, more case-based, more social and more intrinsically-motivated learning.

The understanding of learning inherent in the descriptions is **broadly the socio-constructivist view integrating the acquisition and the participation**, i.e. the individual and social aspects of learning. Learning is seen as an active and constructive process. Construction of knowledge and skills is at first guided and mediated through appropriate modeling, coaching and scaffolding by teachers, peers and educational media (Collins, Brown and Newman, 1989). Mayer's (2004) extensive review shows that ...pure discovery does not yield the best learning gains ... guided discovery learning leads to better outcomes than direct instruction. He concludes that:

**A powerful innovative learning environment** is characterized by a **good balance of discovery and personal exploration**, on one hand, and **systematic instruction and guidance**, on the other hand, while being sensitive to individual differences in abilities, needs, and motivations among learners

**The balance between external regulation by the teacher and self-regulation by the learner** will vary during the student's learning history – **as competence increases the share of self-regulation can also grow and explicit instructional support correspondingly fall**. Following these principles for the design of learning environments will at the same time prevent cognitive overload and **induce** so-called '**germane cognitive load**' that **facilitates effective learning** (Schmidt, Loyens, van Gog and Paas, 2007).

## 7. What principles guide effective learning?

A rich body of empirical evidence supports these characteristics and presents research findings underlying twelve principles of effective learning (Vosniadou, 2001):

- Active involvement
- Social participation
- Meaningful activities
- Relating new information to prior knowledge
- Being strategic
- Engaging in self-regulation and being reflective
- Restructuring prior knowledge
- Aiming towards understanding rather than memorization
- Helping students learn to transfer
- Taking time to practice
- Developmental and individual differences
- Creating motivated learners

#### 8. What do teachers need to support full implementation of a new approach?

- p.57... students and teachers' beliefs about learning can be a serious obstacle... **research shows that teachers interpret the new ideas through their past experiences** (Remillard, 2005) and their often traditional beliefs about learning and teaching. This easily **results in the absorption of the innovating ideas into existing traditional classroom practices.**
- **...the changes implied for teachers are “much too complex to be communicated succinctly in a workshop** and then enacted in isolation once the teachers returned to their schools.”
- There is a **strong need for intensive professional learning** and the development of school leaders and teachers, aimed at the **"high fidelity"** application of innovative learning environments, and materials, while focusing on changing predominant perceptions and beliefs about learning.

For *SmartLearning* to become a sustained model for 21<sup>st</sup> century learning, a **leadership team committed to high fidelity implementation of the system of practices** needs to be developed – a SmartLearning leadership PLC.

- Leaders will engage in **intensive professional learning, over time**, to support them to be able to **model for others how SmartLearning develops adaptive competence in all learners.** They need to have structures in place that enable them to co-plan, co-teach and coach others interested in implementing the approach. They also need to be able to co-plan and present workshops and study sessions designed to develop deep understandings of particular aspects of *SmartLearning* across a grade-span (K-2, gr.3-5, gr.6-8, and 9-12).

- p.59... I think the intensive *SmartLearning* leadership PLC should be based on **design-based research**. ... the aim is to describe how learning occurs under given conditions of instruction... design-based research focuses on designing, implementing and evaluating new instructional interventions – asking, “***Is what we are doing, giving us what we want -- the development of adaptive competence? How do we know?***” This will be the 'art' in *SmartLearning*, and will develop deep conversations within the schools and across the division. ...
- ... **design-based research aims at contributing to the innovation of school practices and so goes beyond merely developing and testing particular interventions. This approach** seeks to contribute to theory-building about learning from instruction and the design of learning environments based on theoretical notions of what the optimal course of a learning process should be to attain a certain educational objective – **in this case, the development of adaptive competence.**

#### 9. How do we implement an innovative approach? How do we go from visionary models to everyday practice?

- p.287. Efforts to put new scientific knowledge of learning and instruction into practice have been fraught with difficulties... Learning scientists seeking to build a practically useful science of instruction have recognized again and again that “**context**” – **the environment, organization and general beliefs that surround any particular designed intervention in learning -- matters a great deal.**
- **Time constraints often have people resorting to “canonical ways of imparting knowledge – that is relying on experts to tell others what they have found... very little practice matches the principles of learning and instruction...**
- Even when they accept new programmes, educators’ attempts to make sense of new information **may lead them to fit the programmes into their existing scripts for instruction... and into their beliefs about which students can learn what kinds of material and which students are ready for investments in learning...**

Beliefs about who can learn well run deep in our schooling system and our societies. Despite substantial research showing that ability to learn can be acquired (Dweck, 2008).

Note: In *SmartLearning* we are committed to developing a growth mindset through a focus on the brain and how learning promotes the formation of new connections between neurons. When we focus on the brain as a learning machine and equip the learners with tools for activating and stimulating pathways in the brain during the learning process, effort and persistence and a learning goal approach makes sense. Learners see evidence of the brain-growth every day and that is highly motivating. We also use partner and team investigation strategies to build purpose and a community for learning, to enhance motivation

and to build collective beliefs about learning. Thinking and understanding is developed and distributed through thoughtful partner and team interactions in a context of the gives each learner the feeling of being included, valued, respected and responsible for learning.

#### 10. Why does telling as a strategy have serious limitations?

- p.289... "... when faced with new knowledge, human sense-making tends to conserve existing understanding. Something more than even sophisticated and audience-friendly reporting is needed; something that fits into what is now understood about **the role of learning in communities as a crucial aspect of how people can change their practices**. A powerful possibility and one only just beginning to be systematically explored, is to develop and support professional learning communities for working educators.

#### 11. Why is a Professional Learning Community a way of crucial way of learning?

- The new theories of situated cognition treat **learning as not simply a matter of individual brains at work acquiring new knowledge or skills, but persons coming to function effectively in specific, socially-defined situations**. Cognition is viewed as a social activity, "stretched over" individuals, tasks and tools. Mind and motivation, skills and self-concepts are linked in an essentially socio-cognitive theory of learning and development.
- p. 291-4... true innovation can rarely happen in an established organization, but instead will require the formation of new breakaway institutions (or structures within the organization like **the formation of a new leadership PLC that uses a blend of action learning in PD sessions and classroom-based learning rounds to develop, implement, study, reflect and refine practice – practice designed to produce learners with adaptive expertise**.
- When chosen purposefully and implemented well, new organizational routines can function as powerful instruments for transforming school practice. Resnick and Spillane (2006) used the term 'kernel routine' to denote an organizational routine that has the potential for transforming school practice by seeding and propagating new forms of practice in schools. The idea is to **introduce a routine that – because it is highly specified and supported by well-defined tools and strategies – can be implemented quickly at a reasonable level of quality under the guidance of a principal or other school learner**. The routine has to be visibly focused on teaching and learning and responsive to established standards of accountability in the school.
- Kernel routines link school management functions to classroom practice. **The kernel routine strategy does not simply impose a new process on teachers but rather provides sets of structured opportunities for teachers to understand and embrace new forms of teaching**. Kernel routines work by connecting and weaving together other forms of organizational routines in the organization.

- **For kernel routines to supplant less productive existing ones**, they must be sufficiently specified, developed and scaffolded so as to change the way people work... By sufficiently specified we mean **clear articulation of the steps in the routine, the rationale for these steps and the requirements for each one. This calls for training procedures and a set of tools or artifacts for performing the routine.**
- In the first phase of implementation, **kernel routines are introduced for faithful high-fidelity implementation with their original design.** Through training and scaffolded performance of the routine, school leaders and then wider groups of classroom teachers, learn to perform it in ways consistent with its designed intent – ***the development of adaptive competence*** – in all learners.

The first phase ‘seeds’ by building social, human and physical capital. This allows the propagation in the second phase, in which the release occurs from the performance of the specifics of the original kernel routine, and allows for the generation and evolution of new routines as well as the re-design of existing ones in the schools.

- **In order to seed and propagate work in schools, a kernel routine must meet the following six criteria:**

First, it must be **centred on... teaching and student learning**

Second, it must be **anchored both in the official curriculum of the district and the enacted curriculum in the classroom** – what is actually delivered to the students.

Third, it must **build common understanding about teaching and learning** among district and school staff members.

Fourth, it must **build trust and mutual access** among school staff members.

Fifth, it must **provide routes by which new knowledge can enter the school’s community of practice.**

Sixth, it must be **open to transformation over time without loss of its core designed elements.**

The **SmartLearning** model provides a system of practices supported by a framework that **itself is a kernel routine**, a research-proven plan, for equipping learners with *adaptive expertise* -- the global goal of education. Through immersion in the approach over time, learners

develop “the ability to apply meaningfully-learned knowledge and skills flexibly and creatively in different situations”.

The beauty of the model is that the kernel routine is based on findings from the learning sciences, and it has a track record of producing dramatic results - over time, over geographic regions, and over socio-economic differences. Everyone grows richer with the approach – students and educators alike.

A kernel routine within the model, the *SmartLearning Round* provides structured school and classroom-based opportunities for people to learn ‘first-hand’ about the approach.

The *SmartLearning* round includes:

- A. **Planning:** the teacher’s leading the session explains the rationale for the learning sequence that everyone will engage with.
- B. Participants take on responsibilities before entering the classroom:
  - **First**, they know they will **engage as learners**, doing the same work as the students.
  - **Second**, they are invited to **track the effects of the learning** on their own thinking and learning, and to notice the effects on the students’ thinking and learning. Their ticket-out is to explain what they noticed about the learning, to the students, at the end of the classroom time.
  - **Third**, they **apply a research lens** to the learning as it unfolds. If this is their first learning round experience, we invite them to choose one or more of the ***principles of learning*** as a lens: active engagement, collaboration, learner responsibility (self-monitoring and self-regulation), or learning about learning.
- C. Following participation in the classroom, they **engage in an analysis and planning session:**
  - The teacher has the first word... sharing what (s)he noticed about the learning.
  - Participants are grouped into teams of three or four and they engage in an analysis process called, “*Mining for Gold*” to dig deeply into aspects of the learning. Through the process they generate insights, connections and important questions.
  - They use performance scales to assess aspects of the learning.
  - They explore variations, and begin planning for implementation in their own classrooms.

When *SmartLearning* interactions are **structured with a balance of professional development workshops and *SmartLearning* rounds**, they meet the criteria of a kernel routine.

p.299 - "... engaging teachers in a tightly constructed routine consisting of a specific set of training practices. The training routine is expected, through the kernelling process, to produce new local school and classroom practices that are 'propagated' from the training routine, but not direct copies of it...

p. 300 - 303...**the more dense the work and personal advice ties among teachers, the greater a schools' innovative capacity** (Moolenaar, Daly, Slegers, in press).

We see the work of *SmartLearning* as a way for a district, division, school or learning team to deeply engage in research-based work, work *that 'generates personal advice ties and creates the conditions to increase innovative capacities'*. The insights, applications and innovations gained through the **dense work** of developing *adaptive competence* promotes rich, deeply considered learning in everyone involved. To see a guide for leading a learning round and the effects on participants, go to [www.smartlearning.ca/reflections](http://www.smartlearning.ca/reflections).



### ***SmartLearning*... leading for 21<sup>st</sup> century learning**

**A sailing metaphor** shows how *SmartLearning* has been designed to develop ***adaptive competence***\* or ***adaptive expertise*** in all learners. Through cycles of whole-class learning, everyone learns how to use and apply the framework and tools to complex, real-world tasks H•U•L•L). They are guided to apply those understandings to *just-right* texts during independent reading (M•A•S•T), and to personal inquiries or disciplined explorations, where they S•A•I•L, single-handed or with a crew. Through the process, learners are prepared to mindfully lead their own learning journeys as powerful examples of 21st century learning.

**SmartLearning...**

**H•U•L•L ↔ M•A•S•T ↔ S•A•I•L ↔ W•I•N•D**

**Whole-class SmartLearning ↔ Guided Independent Reading ↔ Personal Inquiry**

.....  
 all supported by WordWork: the development of orthographic knowledge, terms, vocabulary and

Teachers use the *SmartLearning* framework and tools to develop and guide:

**1. H•U•L•L: higher understanding and lasting learning, with the whole class**

Motivation for learning grows when learners are surrounded with talk about the brain and learning itself, and when they see evidence of growth in their own learning (Dweck, 2007/8; Pink, 2009; OECD, 2010). Talk of the brain, and how their important work stimulates brain activity – in both brain hemispheres – helps learners to grow new capacities and to develop cognitive fluency. (Siegel, 2007/2009; Medina, 2008). The power of a growth mindset develops as learners engage with complex real-world tasks, over time, through cycles of learning that equip them with *brainsmart* learning tools (Close, in progress). These processes support them to connect with, process, demonstrate and reflect on understandings of new information. The goal is to develop ever-increasing personalized levels of understanding, using a host of *skill-specific* tools that learners apply independently. Personal goal-setting in relation to criteria developed with the learners, reflection on tool-use and learning as it is progressing, and formative assessment play a critical role in developing self-regulation during the learning process (William, 2010; Hattie, 2009). Through the interactions they become a community of mindful learners where everyone feels included, valued, respected and responsible for learning.

**2. M•A•S•T: mindful application of skills and tools to complex tasks in *just-right* texts – texts read at the speed of speech with high levels of comprehension -- during independent reading**

Application of newly found skills to complex tasks, in increasingly more challenging texts, is reinforced through personalized coaching conversations, personal goal-setting and reflection, and self-assessment. Learners are guided to self-monitor and regulate their learning throughout the process.

**3. S•A•I•L: Learners engage in solo application of the framework, skills and tools through independent learning:**

These disciplined explorations or personal inquiries are learning journeys where learners mindfully SAIL single-handed or with a crew, guided by collaborative interactions, goal-setting, self-monitoring and self-regulating of the learning through reflection, and self-assessment.

**4. W•I•N•D: *will-full* insights developed through new depths of understanding -- developed during and following engagement with tasks and challenges**

Learners are encouraged to press for insights and more sophisticated understanding during all phases of *SmartLearning*.

Resources to support sailing on the 21<sup>st</sup> century seas of change:

5. **Compass:** commitment to personal goal-setting and assessment...

Instruments show us where we are, and where we are headed to. Instruments reveal challenges to watch for, and ones to overcome, inviting us to “stay the course through corrective steering, or to change course based on new knowledge (OECD, 2010).”

All learning starts with goals, and is guided by the development and refinement of criteria along the way. Reflection guides self-monitoring and self-regulation of the journey.

6. **Lighthouse:** Learning is guided by continual reflection...

Reflective light guides the way, shining on what is working and what you need to do next, giving the learner opportunities to develop meta-cognitive knowledge through the insights and connections gained along the way.

7. **Anchors:** strongly held beliefs about learning...

Hold-fasts are identified to secure the learning: the power of a community to support and enhance learning; the power of a growth mindset; higher achievement with complex tasks; the power of talk for growing intelligence; the power of time, movement and sleep; the precision behind tool-choice; the power of balancing brain activity; the power of using criteria for goal-setting and reflection...

8. **Docks/ports:** welcoming places... to stay awhile; a place to re-view goals, to take on provisions, to check and repair, to relax and gain strength -- places to connect with others, to learn through others’ experiences.

9. **Lines and power cords:** sources of security, power connections for re-charging. These include new learning opportunities, where you generate the knowledge and energy to venture out on the next plan of action.

.....

**Terms:** the vocabulary and orthography of the words read, spoken and understood, developed through **WordWork**, support all aspects of HULL↔MAST↔SAIL↔WIND.

\***Adaptive competence** has been identified as a global goal for education. Adaptive competence is the ability to apply meaningfully-learned knowledge and skills flexibly and creatively in different situations (OECD, 2010). For a discussion of the research behind developing **adaptive competence** or **adaptive expertise** in all learners, go to: [www.smartlearning.ca/spring](http://www.smartlearning.ca/spring) 2011 update.

References (to be added)