

Innovator

Rocky View's view of the future

Today's 21st Century learner is faced with challenges that are without precedent. Over the past 30 years, the world's population has more than doubled, resulting in an increasing strain on the world's natural resources, on financial institutions, on health care, and on education. Compounding these challenges is the mass unpredictability of our times. The rapid advancement of technology, the plight of global warming and the call for sustainability leaves much uncertainty as to what the world will look like in five years and beyond.

Within this context it is not surprising that employers of today demand employees be proficient in critical thinking, problem solving, and innovative thinking, since many of the jobs they will have don't even exist yet. So what is the role of educators in building these skills?

Rocky View Schools' third edition of Portrait of a 21st Century Learner focuses on honing students' innate ability to generate, accept and implement new ideas, processes and products, better described by the Portrait's third characteristic, to be "an innovator".



Understanding innovation

Innovation has been flagged as an essential 21st Century skill as it is believed innovative thinking fuels a culture of curiosity and encourages people to look beyond the norm for solutions or opportunities that can transcend obstacles in the face of uncertainty. Leading companies in the field, such as Research in Motion (Blackberry Smartphones) and Apple, profess that innovation is best nurtured in a collaborative environment where information sharing is expressly encouraged and where change is embraced, not shied away from. These leaders further credit real, sustainable success as a derivative of doing things differently, and that this, in and of itself, requires courage because change involves risk.

Sir Kenneth Robinson, an internationally recognized leader in the development of creativity, innovation and human resources, believes there are three misconceptions that stifle innovation in today's classrooms:

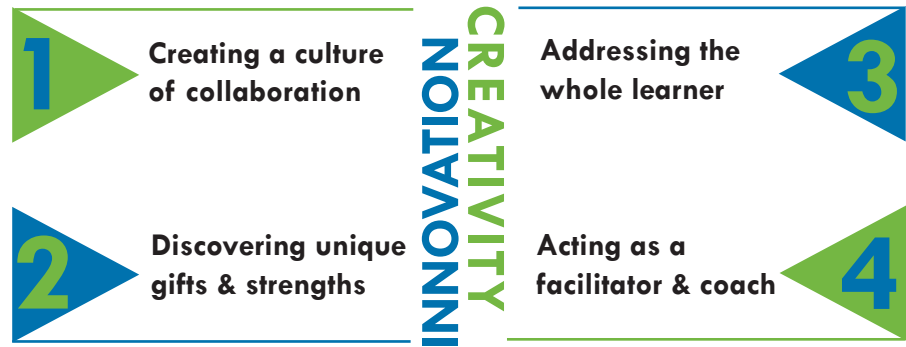
1. *Only a few people can be innovative* - All students possess the innate ability to be creative and innovative thinkers. A policy for creativity and innovation in education begins with fostering the mind-set that it begins with everyone, not just a few.
2. *It's about special activities* - Most people associate innovation with technology and the sciences, but innovation is really a function of everything we do. So in education, innovation must be integrated in every subject.
3. *It's a free-for-all* - Innovation is a disciplined process, not a single event, that requires skill, knowledge and control. Fostering innovation in education requires teachers to engage students' critical thinking skills, as well as imaginative insights and fresh ideas.

Given the culture needed and the misconceptions that have to be overcome about innovation, how do we create conditions in the classroom that will prepare students for this future?

Promoting creativity and innovation

Education Consultant and author, Dr. John Brown, believes there are four conditions that help promote creativity and innovation in education:

Fig. 1. Promoting Creativity and Innovation



(Adapted from the Association for Supervision and Curriculum Development's *21st Century Skills*, Video, 2008)

Creating a culture of collaboration

According to Brown, nurturing innovation and creativity in the classroom requires two main variables be present: social interaction and interdependence - after all most original thinking comes through the stimulation of other people's ideas and thoughts. Take Microsoft giant Bill Gates for example. Gates may be the founder of the Microsoft Corporation, but his software breakthroughs have always come through the fierce collaboration amongst people with common interests but with very different ways of thinking.

In classrooms, where collaboration is the norm, rather than a special activity, Brown says collaboration should aim to: 1. promote argumentation and consensus-building; 2. improve critical thinking skills through practice in hypothesizing and seeking reasoned consensus; 3. generate new ideas; 4. promote student interaction; and 5. celebrate diversity. Six strategies that can be applied to any subject area, that nurture collaboration are:

Fig. 2. Collaborative Strategies

Strategy	
Problem-posing	Students are given a disciplinary problem framed as an open-ended question to which students must propose and justify an answer. Groups may summarize answer in one sentence.
Question-generating	Students break into groups to brainstorm possible questions related to topic being explored. Students then refine their lists into the two or three best questions and explain why each question is a good one.
Believing & doubting	Students first enter imaginatively into the possible truth of any statement, arguing in its favor (believing) and then stand back from it, adopting a healthy skepticism (doubting).
Evidence-finding	Students find facts, figures, and other data or evidence to support a premise, with the goal of learning how experts in a field use discipline appropriate evidence to support assertions.
Case	Devise cases that require group decision-making and justification. If a case involves different roles, each group can initially be assigned one or two of the roles and develop best arguments.
Rough draft	Students read and respond to each other's work in progress, with the goal of stimulating global revision of drafts to improve ideas, organization, development.

(Adapted from John C. Bean's *Engaging Ideas*, 1996)

Discovering students' unique gifts and strengths

In addition to creating a classroom culture where diversity, the exchange of ideas and building upon collective ideas aids in the development of innovative thinking skills, teachers need to help students find their personal voice, strengths and interests. Brown recommends four areas of practice be explored:

- ▶ **Student choice** - allow for student choice and decision making whenever possible
- ▶ **Project-based learning** - emphasize project-based learning to anchor the teaching-learning process, allowing students to engage in authentic, real world experiences
- ▶ **Creative exploration** - employ play, creative and flow activities that promote both non-threatening challenges and active student engagement
- ▶ **Multiple modalities** - allow students to use multiple modalities, express themselves via multiple media and engage in tasks that require open-ended and creative thinking

Addressing the whole learner

According to Brown, key to connecting an individual learner to a community of learners is addressing the needs of the whole student. Specifically, teachers need to build an understanding among students that their classroom is a community, where emotions play a role in the learning environment. Students must be guided in the development and mastery of key social skills associated with emotional intelligence, e.g. active listening, restraining impulsivity, understanding “hot buttons”, building consensus. They also must be actively involved in monitoring their own progress towards goal attainment.

Acting as a facilitator & coach

In their paper “Put Understanding First” (Education Leadership May 2008) Grant Wiggins and Jay McTighe build on Brown’s model by stating it is the teacher’s role to act as a facilitator and coach. As facilitators, teachers help learners make meaning and understand important ideas and processes. They guide learners in actively processing information and exploring complex problems through employing instructional strategies such as analogies, graphic organizers, divergent questioning and probing, simulations, problem-based learning, reciprocal teaching and student self assessment. In a coaching role, teachers provide opportunities for students to transfer learning in increasingly complex situations. They establish clear performance goals, provide models and give feedback. They also provide just-in-time teaching (direct instruction) when needed. Instructional strategies include conferencing; encouraging student self-assessment and reflection; and providing specific commentary feedback and corrections in the context of authentic application.

Indicators of innovative thinking

Educational researchers such as the Metiri Group believe innovative thinkers need to possess six inherent qualities:

- **Adaptability/Managing Complexity** - The ability to modify one’s thinking, attitude, or behaviour to be better suited to current or future environments.
- **Self-Direction** - The ability to set goals related to learning, plan for the achievement and analysis of those goals and independently manage time and effort.
- **Curiosity** - The desire to know or a spark of interest that leads to inquiry.
- **Creativity** - The act of bringing something into existence that is new and original.
- **Risk-taking** - The willingness to make mistakes, advocate unconventional or unpopular positions or tackle extremely challenging problems without obvious solutions.
- **Higher-Order Thinking and Sound Reasoning** - The cognitive processes of analysis, inference, evaluation and synthesis applied to a range of problem-solving contexts.

Assessing students’ progress

In evaluating students’ progress towards becoming innovative thinkers in the 21st Century, the Metiri Group assesses students based on a continuum of learning model. The following figure illustrates how two of these inherent qualities can be evaluated:

Figure 3: Continuum of Progress

Quality	Novice	Proficient	Advanced
Risk-Taking	<ul style="list-style-type: none"> • Unwilling to tackle tasks that do not have specified methods or where success is not a given 	<ul style="list-style-type: none"> • With encouragement student willing to tackle tasks that involve unknown procedures 	<ul style="list-style-type: none"> • Willing to independently tackle tasks that involve unknown procedures and risk of failure
High Order Thinking	<ul style="list-style-type: none"> • Not able to identify or construct criteria for evaluation 	<ul style="list-style-type: none"> • Able to conduct evaluations devising criteria 	<ul style="list-style-type: none"> • Creates “knowledge products” with high levels of creativity and insight

(Engage 21st Century Skills <<http://www.metiri.com>>2008)

The connection between home and school

Innovative thinking is essential for success in school and in life. Parents can nurture their child's innate desire to be creative at a very young age through inventive play. This fosters original thinking and builds upon this mind-set whenever a child is confronted with new situations. Listed below are a few tips to building creative and innovative thinking in children.

Give them ideas. Today's child spends too much time in front of the television and game boxes. Children need to be encouraged to come up with activities they find interesting and motivating. Get your child started by sharing ideas from your own childhood. Did you create pictures from magazine cutouts, build forts out of bedding, or write stories to share with your family? For older children, suggest they volunteer. Outside of connecting with others in a collaborative effort, volunteer experiences help children gain new insights and interests.

Nurture your child's interest. Is your child fascinated with Bob the Builder? Ask your child to share his/her favorite episode and then offer creative writing ideas like writing a new ending to story. Alternatively, suggest your child write a "mini-saga" about a place or person that fascinates them. Mini sagas are extremely short stories, just fifty words long. Like all stories they have a beginning, a middle and an end - creativity abounds!

Help build on their ideas. When your child sits down to tackle a new project provide them with a bulletin board that can be turned into an inspiration board. Each time they see something that they find compelling that relates to the project - a photo, a headline from the newspaper, etc. - have your child tack it to the board. Before long, they will see connections between images that will enliven and expand their work.

Give them freedom. Avoid filling every minute of your child's day with scheduled activities. Unstructured play time gives kids an opportunity to stretch their creative muscles. Pose a few suggestions and then watch as they incorporate your ideas and branch out on their own.

Set an example. Model the behaviour you would like to see. Chances are, if you approach daily routines with a creative heart, your child will too. Change lyrics to songs, make animals out of towels when doing the laundry or even dance with the broom while sweeping the floor. Kids see; kids do!

Suggested resources

Azzam, Amy M., "Why Creativity Now? A Conversation with Sir Ken Robinson". Educational Leadership September 2009 Volume 67. Association of Supervision and Curriculum Development Website <http://www.ascd.org/publications/educational_leadership/sepember09/vol67/numbe01/Why_Creativity_Now.aspx>. Last accessed Oct. 2009.

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Boix-Mansilla, Veronica, Gardner, Howard. "Disciplining the Mind". Educational Leadership May 2008 Volume 65. Association for Supervision and Curriculum Development Website <http://www.ascd.org/publications/educational_leadership/february08/vol65/numbe05/Disciplining_the_Mind.aspx> Last accessed Oct. 2009.

Metiri Group. "Engage 21st Century Skills". Website <<http://www.metiri.com/features.html>>. Last accessed Nov. 5, 2009.

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Wiggins, Grant, and McTighe, Jay. "Put Understanding First". Educational Leadership May 2008 Volume 65. Association for Supervision and Curriculum Development Website <<http://www.ascd.org/publications/educational_leadership/may08/vol65/numbe09/Put_Understanding_First.aspx>> Last accessed Oct. 2009.

For more information

For further resources on Rocky View Schools approach to innovative thinking contact Director of Schools Dave Morris at 403.945.4019 or email to dmorris@rockyview.ab.ca.