

The Teaching Revolution and 21st Century Skills

Lance King - 2012

I work with students in many high schools around the world and over the last two years I have asked every class the same question – “How many of you have a web-capable phone?”

Two years ago the response was about 5%, today it is usually around 80% and just recently I had my first 100% response.

This is significant.

How long will it be before every child in every classroom has a web-capable phone.....that they're not allowed to use?

Right now there are:

- 6 billion cell phones in the world (world total population is 7 billion)
- 85% of new phones are web enabled
- 2 billion broadband subscriptions
- 255 million websites
- 150 million blogs
- 8 trillion text messages sent in 2011
- 107 trillion emails – 89% of which were spam

How long will it be before:

- every piece of subject matter is available to every student on the internet, and
- they all have access to internet linked devices, and
- they all have access to high speed broadband all day?

What will teaching look like then?

What will be the key skills students will need to cope with and take advantage of, this environment?

This is not the future, this is today!

Imagine a school where:

- 1) the entire focus of teaching is on the processes of learning, where the aim of every lesson is the development and improvement of the skills of effective learning, using the subject matter of the lesson as the material for the student to practice their learning skills on
- 2) in every class students work in groups of 3-4 with one high-speed internet linked data tablet device per group
- 3) the objectives for each lesson are stated by the teacher as:
 - the learning skills to be practiced
 - the subject matter to practice those skills on and the best web-based sources to use to find that subject matter
 - the questions to be answered
- 4) where learning is by true exploration and inquiry.

I believe that right now we stand on the brink of a revolution in education (what I call the POSBGIL Revolution) which is not a revolution in learning because everyone has always learned best this way, what it is, is a revolution in teaching! Maybe the most significant one since Gutenberg.

The revolution in education involves teachers abandoning 'transmission' teaching and adopting principles of skills based, guided inquiry learning. This means teachers teaching the skills of good learning using their particular subject matter as the 'meat' for students to practice those skills on. It involves students utilising net-capable devices, working in small groups, accessing subject-based websites, practising cognitive skills like searching, selecting, verifying, validating and corroborating information as well as social skills of collaboration, communication, team work and affective skills like perseverance and self-motivation. In this scenario, teaching becomes about making explicit all the processes of learning and guiding the students on a pathway of inquiry to achieve specific measurable content and process based outcomes (POSBGIL – Process Oriented, Skills Based Guided Inquiry Learning). Helping the students to ask the right questions but never providing the answers.

What this new type of teaching is **not** about is teachers using the internet as just one more textbook. When every student has access to all the information in the world 24/7 then the most marketable skills will be the skills of good learning. How to find the right information, process it well, extract what you need and move on having learnt something new. These are the skills of the self-regulated learner and in order to become competent in these skills children need to be put in the position of being able to practice the regulation of their own learning.

If creating 'lifelong' learners is the aim of schooling I believe that right now, through the confluence of five important factors we have the best opportunity yet to achieve that aim.

- The development of a 'learning-skills' curricula within the school qualification systems of many countries
- The proliferation of high quality school subject based websites
- The ubiquity of internet accessible devices
- The availability of high speed broadband
- The high level of comfort today's children have with the digital world

The most motivating learning has always been self-regulated learning (self-directed, self-managed, autonomous, independent) and yet up to now the infrastructure of education has not allowed for learning by exploration and discovery except at the elementary level. The proliferation of internet based school subject websites and the ubiquity of data delivery devices has changed all that.

Teachers no longer need to be the 'font of all knowledge' they just need to know where to send their students to find everything they need. This means that every teacher needs to be familiar with every website that deals with their particular area of expertise and to know those websites well enough to design every lesson around the content found there. The school must have the infrastructure in place to support one device and one high speed internet connection per 3-4 students at the very least. One internet capable device per student in the classroom is not necessary and can even serve to increase isolation and decrease collaboration, communication and recall – **this is a very significant finding!** (see Sugata Mitra <http://www.ascilite.org.au/ajet/ajet21/mitra.html> or video http://www.ted.com/talks/lang/en/sugata_mitra_the_child_driven_education.html)

Then the focus of teaching can be moved to the inculcation of effective learning skills.

Intrinsically motivated learning is achieved through the application of a dynamic, internally controlled set of metacognitive, cognitive and affective processes that positively influence a student's tendency to approach,

engage with, expend effort on, and persist in tasks of learning in an ongoing, self-regulated manner. Exactly what everyone does when they are learning something new that they are intensely interested in.

Metacognitive processes are those that focus on the self management of learning, planning, implementing and monitoring learning efforts, as well as gaining the knowledge of when, where, why and how to use specific learning strategies in their appropriate contexts. Cognitive processes are those which focus on developing the particular skills necessary to facilitate the acquisition of knowledge or skill, and affective processes are those that focus on such non-cognitive aspects of learning as motivation, self concept and the skill of selective attribution.

The best students in the world - those whose study is most effective in helping them to pass their examinations - all have one characteristic in common, metacognitive awareness. In other words they treat learning as a process requiring many different techniques and strategies depending on the subject and the context . They actively seek out options for every stage of the learning process, they try out different things and they notice what works and what doesn't. To do this they are continuously engaged with both the subject matter they are learning and the processes they are using to learn that subject matter. They view any learning failure as a failure of process rather than that of the individual, they find better processes and apply them, they reflect on the results and they continually improve the success of their learning efforts.

To achieve this awareness within students while they are engaged with learning at school requires a re-orientation of the classroom teaching/learning dynamic towards the development of what are often called 21st Century Skills.

It has often been said that most of the jobs children in school today will take have not been invented yet and that most of today's children will have at least 5 different careers in their lifetime and will need to be able to re-invent themselves for each career change. Also it is said that 95% of jobs in the future will involve information processing through an electronic interface of some kind.

A 2007 survey of 400 hiring executives of major USA corporations asked what knowledge *and* skills they were looking for in potential future employees. The results were (in priority order):

- 1) Oral and written communication skills
- 2) Critical thinking and problem solving skills
- 3) Professionalism and work ethic
- 4) Teamwork and collaboration skills
- 5) Ability to work in diverse teams
- 6) Fluency with information technology
- 7) Leadership and project management skills

Knowledge of mathematics came 14th on the list just ahead of science knowledge and foreign language comprehension. The highest priorities for employers were all skills based - '21st Century' learning and thinking skills.

In the UK in 2007 the Department for Education's own research in *Learning Skills and the Development of Learning Capability* concluded that

“the results suggest that the development of learning skills and capabilities should be embedded in the curriculum, as well as being taught explicitly to pupils.”

By 2008 the QCA had created their own “framework of personal, learning and thinking skills essential to success in learning, life and work” which required students to become:

- Independent enquirers
- Creative thinkers
- Reflective learners
- Team workers
- Self-managers
- Effective participators

In my country, New Zealand, we have a new curriculum which focuses, on the development of what are called the 5 Key Competencies:

- Thinking
- Using language, symbols and text
- Managing self
- Relating to others
- Participating and contributing.

Poland has the following set of skills and competencies that have to be acquired by the end of lower secondary education:

- Reading
- Mathematical thinking
- Scientific thinking
- Communicative skills
- Technological skills
- Information usage
- Self-orientation
- Team working

Other OECD countries that have similar overarching sets of key or basic learning and thinking skills or competencies include Belgium, Italy, Korea, Mexico the Slovak Republic, Spain, and Turkey.

In the USA, 47 states have now agreed on a common core curriculum of learning and thinking skills to be taught at the elementary level. Called the Elementary Integrated Curriculum (EIC) it includes:

Academic Success Skills:

- Collaboration
- Effort/Motivation/Persistence
- Intellectual Risk Taking
- Metacognition

Creative Thinking Skills:

- Elaboration
- Flexibility
- Fluency
- Originality

Critical Thinking Skills:

- Analysis
- Evaluation
- Synthesis

Within the global education system of the International Baccalaureate (IB – over 3000 schools world-wide) support for the gaining of learning skills is through a specific programme of study of its own called Approaches To Learning (ATL) within the Middle Years Programme (MYP). ATL Skills include:

- Communication & Collaboration
- Self Management
- Information, Media & Critical Literacies
- Critical Thinking
- Creativity & Innovation
- Reflection
- Transfer

Within which clusters more than 165 individual skills have been identified.

All around the world systems of education and individual schools are implementing a range of 21st Century skills programmes to give their students the advantages of key pre-requisites for today's world of study and enterprise.

To develop these skills the key task for teachers is to help students become aware that they can take positive self control in learning situations, plan deliberate strategy use and by doing so increase both their sense of personal competency and their learning achievement. Once perceptions of competency and positive self control in learning are developed, students are much more inclined to try out new cognitive and affective strategies in new learning situations and ultimately develop full control over their own learning and become fully self-regulated (self-managed, self-directed, autonomous, independent, lifelong) learners.

The challenge for teachers is in moving from transmission teaching where the teacher is the font of all knowledge to a more facilitative style where the teacher is helping the students to discover the information for themselves.

The most effective method is through ongoing, process focused teaching by subject teachers within standard subjects. The process focused teacher is the one whose highest value is the teaching of learning skills and who uses their particular content as the vehicle through which to teach effective learning processes. This is not to deny the importance of any taught content but is an approach which brings about a dual focus in the classroom – on both content and process. Many studies have shown that the most uniformly positive results in terms of academic engagement, understanding, transfer of skills and high performance in assessments come about through a focus in the classroom on learning strategy training in a metacognitive, self-regulated context in connection with specific content.

The 'learning skills' focus of international and national curricula aiming at developing 21st Century Skills within students has made the development of process focused teaching possible within many educational structures. The proliferation of high speed broadband, internet connectable devices and free, school-subject based websites has made guided inquiry learning possible in many classrooms. The real challenge is putting the two together.

Luckily we have the experience of others to draw on. In 1999 a national innovation programme was introduced into Dutch secondary education, aimed at encouraging teachers to foster what they called ASRL – Active Self Regulated Learning. Twelve years later the entire project was reviewed - It tells its own story very clearly:

“The innovation focused on the higher grades (15 - 18 years of age) of upper level secondary education, the grades preparing for higher education. It was based on three general ideas:

- (a) Self-regulation of learning - students have to learn to regulate their own learning process, considering the importance of life-long learning. This means that students should gradually become the owners of their own learning process. It also implies more attention to the affective aspects of learning.
- (b) Learning as active construction of knowledge. Students learn better when they actively construct their own knowledge; and
- (c) Collaborative learning. Students should learn in interaction with fellow students. Collaborative learning is seen as a powerful learning environment and collaborative skills are believed to be necessary for future work.”

And the results were....

“The reform implied a fundamental change in teachers’ educational and pedagogical role. The general aim of the renewal was to prepare students more effectively for higher education and lifelong learning. A more specific aim was for students to learn how to regulate their own learning processes. Teachers were therefore expected to focus more on facilitating, supporting and monitoring student learning processes and less on transmitting subject-matter knowledge to students, and to foster students’ ASRL in their daily work practice.”

“However, in the period of early implementation of the reform, hardly any practical examples of instructional methods for this new teaching approach were available. Schools were expected to develop suitable pedagogy themselves, with the help of educational advice centres. Evaluation studies reported implementation processes that often lacked a clear vision and policy. Teachers’ daily classroom practice did not show much self-regulated learning and activating pedagogy. Many teachers still focused particularly on the subject-matter and learning outcomes and far less on students’ learning processes.”

The biggest stumbling block to achieving the goals of self-regulated learning was that teachers found it hard **not** to teach.

This is the challenge.

This is why I am pointing to a revolution in teaching not in learning.

It is the teachers who must learn how to **stop teaching and allow learning to take place**. Only by being allowed to practice the skills of self-regulated learning will students ever become self-regulated learners.

In 2009, the OECD working group summed up their overall findings in ‘*21st Century Skills and Competences for New Millennium Learners in OECD Countries*’ as:

- 1) Most countries subscribed to the importance and policy relevance of 21st century skills and competences
- 2) Most countries were attempting to integrate these skills in a cross-curricular way, across subject areas
- 3) Clear policies for formative or summative assessment of these skills were lacking in all countries surveyed
- 5) There were few teacher training programmes available in any country that targeted the teaching or development of 21st century skills.

The key to the creation and development of today’s students as tomorrow’s self-regulated learners will be effective professional development (PD) of teachers.

This can be achieved, with well structured PD which focuses on the three strands of developing self-regulated learners (SRL). By teaching teachers:

- 1) how to teach cognitive and affective learning skills within the context of their subject based lessons
- 2) how to make the classroom experience for the students one of skills based, process oriented, guided inquiry learning
- 3) how to help students to develop metacognitive awareness of content, skills and strategy use through reflection

If the real goal of education is the creation and development of lifelong learners then I believe that with the innovations of new national and international curricula combined with the proliferation of school subject based resources available on the internet the key infrastructural factors are in place today within most countries to bring about a revolution in teaching and hence a revolution in school based learning.

Key References for POSBGIL:

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