Authentic Learning - A way forward

A research report prepared for the
ASB/APPA Travelling Fellowship Trust

Maria Bastienne Kruger
Principal
Hukerenui School
Phone 09 4339895
principal@hukerenui.school.nz

Contents

Executive Summary

It is important to rethink educational strategies to support our NZ learners to develop futuristically, taking in account effective student engagement, providing opportunities for learning to have a purpose, to develop creative and critical thinkers, and align current fast changing digital technology to support this development within an authentic and culturally sensitive educational curriculum.

Authentic learning is real life learning. It is a style of learning that encourages students to create a tangible, useful product to be shared with their world. Once an educator provides a motivational challenge, they nurture and provide the necessary criteria, planning, timelines, resources and support to accommodate student success. The teacher becomes a guide on the side or an event manager, a facilitator not a dictator. Processes become the predominant force and the content collected is organized appropriately into portfolios.

At Hukerenui School, we developed whole school authentic learning; we use our school land more effectively for our education, use problem solving programmes, learn through play in the junior years and honour neuroscience and programmes that are creative and futuristic. The success of our implementation inspired me to research those elements that are required to support schools in NZ to implement authentic learning in any school.

New entrants have been exposed to new technology at a rate beyond our own; their siblings, will again surpass them. Robots are performing operations, industries are computerised, machinery driverless. Jobs are changing. Ken Robinson: "Yesterday's classroom won't prepare our kids for tomorrow's job market. It's time to rethink education, teaching the lessons they'll need for careers we can only imagine"

My observation in schools where authentic learning was developed by creative teachers and principals who were leading the way to provide such opportunity, students were highly motivated, excited and interested to develop their knowledge further to support the outcome of their learning.

Whether it was learning to fly, the science needed to save a species, the literacy, maths and technology knowledge needed to make these things happen, made it obvious that this is what a confident learner looks like when we actively work to develop opportunities to produce creative thinkers in a 21st century environment.

It was clear that authenticity was an important factor in culturally responsive practices. Teaching the language or cultural practices needs a depth of understanding which commanded respect when it was taught by a speaker of the language, or someone from that specific culture. (Sometimes called a "knowledge keeper")

The Future Problem Solving model by Dr. Paul Torrence develops creative thinkers. These initiatives ignite passion for self-directed learning, creating opportunities for creativity and problem-solving skills easily adapted to changing times. I have found that this model will be an excellent tool for staff meetings for buy-in to the development of a whole school authentic learning programme. This is described further in the conclusion and recommendation part of the report.

Another important observation is that the New Zealand Curriculum provides schools the ability to implement a rich and integrated curriculum; it does not prescribe content, rather Achievement Objectives. This is very different to what has been found in countries like America, Canada and Finland. Teachers in these countries struggle with the constraints of textbooks and prescribed content. They have however more resources (teachers, buildings, equipment), which will make the delivery of an authentic learning programme very easy.

In conclusion, the implementation of an Authentic Learning Programme is two-fold.

A whole school approach needs very specific elements, and a classroom teaching programme another set again. It has been inspiring to observe and learn from others to be enabled to describe the elements needed for a possible model for implementation.

Acknowledgements

I was honoured to have been awarded 2 school term's leave on full pay and a monetary grant to travel and gather information that:

- Would support the further development and implementation of authentic learning practices in schools
- Observe how IT can support authentic learning
- Investigate culturally responsive teaching strategies for first nation learners in America and Canada.

The diversity of educational strategies, management and governance I encountered greatly enhanced my perspective of how broad the challenges could be, but also for the possibilities for authentic learning to take place in any system, whether it is teacher led, management led, or district led.

My study took me to various states and institutions across America, Canada and Finland providing opportunity to observe a variety of teaching, management and governance strategies.

Background

It is our responsibility to prepare our 21st century learners to deal with a fast-changing world. The pace with which technology has developed in the last 10 years, suggests that life will look very different in their future – especially with the more frequent use of Artificial Intelligence in the workplace.

We should be looking at the habits and skills that educators hope will serve students as the career landscape evolves.

Are the robots really coming for students' jobs? The role of schools has long been to prepare students for life after graduation, but experts have conflicting views about the best path for schools as students face an unknown job market. How are educators designing learning with future-readiness in mind?

According to the Partnership for 21st Century Skills (P21, 2007b), research suggests that when teachers integrate real life learning experiences that focus on resources, strategies and contexts that students will encounter in adult life, absenteeism rates fall, cooperation and communication grow, and critical thinking skills and academic performance improve.

The Study

What I know, and have experienced by working through a process of student led problem solving, is that by using a real-life problem and a clearly defined expected outcome, real life skills can be used for life and can be developed in students of any age. I believe we need to start this at primary school level, because this is a time when learners are inquisitive about the real world and aspire to find out how things work.

This inquisitiveness inspires them to want to learn more and we need to tap into this enthusiasm for learning by providing them with the support to solve problems, learning real life skills through this and achieve success in acquiring knowledge. Their success inspires them to want to find out more. We know success, not failure, is what will give students confidence to attempt the next step.

During the authentic learning process, students are driven to use reading and writing through the purpose of the real-life learning experience, which then results in optimum student engagement for learning.

At Hukerenui School, we implement real life learning, honour neuroscience, develop creative thinking skills and apply this to authentic learning. We have been implementing real life learning by integrating our planning to the science, social science, technology and health curriculums. In our case, using resources on our land provides the platform for students to apply critical thinking and the knowledge they have learnt in maths, reading and writing, which becomes the backbone to achieve successful real-life outcomes.

We dedicate an hour per week for classes to develop their capabilities.

For the past 3 years our intermediate class leased 5ha of land and plant maize each year. They do a SWOT analysis, organise all the contractors, fertiliser companies, phone those involved, according to their planting schedule, and work out the costs and profits.

These students have told me that they would rather lease land and grow a crop than work in McDonalds to subsidise them, for instance, when they go to university.

Other age groups built their capability by propagating and growing lavender and manuka, extracting essential oils using the school's still, researching the medicinal properties and making healing balms, lotions and spritzers, which they sell at school and on a website they created.

Our year 3+4 class built their capability through authentic learning by keeping bees, learning to grow and sell queen bees and then used them to split hives to expand the number of their hives. They used polystyrene to insulate their hives to have drones earlier in the season. Experimenting, problem solving and enterprise – skills for life!

Our students are farming alpacas, making compost and learning about soil science, then using this knowledge when planting vegetables and fruit trees.

These opportunities have brought enormous gains for students achieving success. We all know success breeds an aspiration for more success.

Literary Review

'Any fool can know. The point is to understand'

Albert Einstein

Ken Robinson states: "Yesterday's classroom won't prepare our kids for tomorrows job market. It's time to rethink education, teaching the lessons they'll need for careers we can only imagine. "

Due to the nature of curriculum development at my own school, I was interested in gathering information to see how, or whether, like minded pedagogies of authentic learning are implemented on the global stage and then to utilise this knowledge to develop our current practice further.

My aim was to find those elements needed to develop a model of authentic learning that could be effectively implemented and sustained in schools.

A report was written as part of NZ's participation in the Global Education Leaders' programme (GELP). "*Supporting future-oriented learning & teaching – a New Zealand perspective." Report to the Ministry of Education, R Bolstad & J Gilbert with S McDoweall, A Bull, S Boyd & R Hipkins New Zealand Council for Educational Research.*

This indicates a willingness from the MOE to review practices and rethink learner and teacher roles, supporting new technologies and cultural diversity.

Many Principals are currently reviewing implementation of the NZ curriculum document, looking at developing creative thinkers rather than focusing only on maths, reading and writing achievement. There is an argument towards building learning capacity and capabilities rather than just gaining knowledge.

It also values the role of ICT in 21st century learning and shows the curriculum cannot be implemented effectively without it; the challenge being to identify the best use of the hardware to ensure that best learning occurs.

"From the standpoint of the child, the great waste in school comes from his inability to utilize the experiences he gets outside while on the other hand he is unable to apply in daily life what he is learning in school. That is the isolation of school - its isolation from life. " *(Dewey, 1915)*

Authentic Learning

My objective was to gather information from other educational bodies to see whether there were any similar implementations of authentic learning and the difference it was making.

I visited several institutions who were excited about starting a variety of real-life learning experiences, although most were not authentic. Some teachers started working on developing project-based inquiry learning. This is a step up from a very basic and factual curriculum with some highlights of some real-life learning in some classes but not yet authentic.

There is a strong movement in Vermont, USA for personalised learning. Each students' personalised learning goal is designed to apply their learning to a goal that supports sustainability. The UN goals (a very exciting platform) form part of some schools' sustainability focus, others developed a leadership programme focused on sustainability. It fits with citizenship and has a strong community focus.

These learning pathways create opportunity for real life learning experiences with the achievement or outcome of authentic learning, the "product" being always fit for public consumption and be presented as such.

This is only possible because the State of Vermont has adopted it, and a grant from a personal institution was made available to support the implementation in schools who were interested.

I became aware that the design and implementation of an authentic learning pedagogy would need approaches on both a management and teaching level.

It became clear that a passionate educator is an important element needed to design and drive any implementation that requires a different approach. Great examples are the work of Steve Revington and Stephen Ritz.

What is Authentic Learning

There is a difference between Project based learning vs Authentic/real life learning.
The following articles illustrate how authentic learning is different.

Some Misconceptions about Authentic Learning: John F. Cronin

To keep the authentic learning movement alive, we must dispel some myths that may discourage teachers from exploring the potential of this approach.

One misconception is that if tasks are not original, creative, and fun, they are not authentic. Of course, many examples of authentic tasks in the literature *are* stimulating projects with immediate relevance to the lives of students. This is wonderful! Students need more of these opportunities.

Unfortunately, educators sometimes confuse engaging tasks with authentic ones.

The point of authentic learning is to let students encounter and master situations that resemble real life. These situations are often stimulating and engaging.

It is a grave mistake, however, to shield students from the fact that some of life's work is tedious and unimaginative but, nonetheless, necessary. An important part of maturing is learning the self-discipline to face these kinds of tasks.

In the classroom: Realizing the Potential of Authentic Learning

Educators want to create authentic learning environments, but only act when they are convinced that they can manage the work. Taking three steps to counter these fallacies will help educators manage the task and improve their prospects for success:

- *Work toward more authenticity, not complete authenticity*. Not every learning activity must duplicate real-life experiences. The hope is that, over time, activities will more closely resemble the real world than they have in the past. When the expectation is more reasonable, people may warm to it more quickly.
- *Exploit available opportunities for authentic learning*. Few people bake apple pies when they must begin by planting the trees. The process of change begins with taking advantage of available opportunities and more systematically tying them to curriculum and assessment.
- *Start with less complex tasks*. Educators will have an easier time implementing authentic learning if they feel free to begin with simpler adaptations of the concept. Drafting a letter to the editor on a local environmental issue, for example, is an easier task to introduce than creating a Model United Nations to investigate global environmental problems

The power of the authentic learning movement has been in the simplicity of its central idea: students' experiences in school should more closely resemble the experiences they encounter in real life. The potential of this idea will be lost, however, if it is muddled by dense vocabulary and implementation models that are too intricate for practitioners.

By developing a common language and keeping a focus on the simple theme of the movement, we can help alleviate the misconceptions about authentic learning. More

important, by keeping our expectations realistic, capitalizing on available opportunities, and starting simply, we can ensure that the window of opportunity remains open.

Endnote

1 G. Wiggins, (February 1991), "Standards, Not Standardization: Evoking Quality Student Work," *Educational Leadership*48, 5: 18–25.

Phenomenon-based learning is a lot like project-based learning, a more familiar term in the United States. Both prioritize hands-on activities that give students control over the direction of the project and both emphasize assignments that relate to the real world. They also emphasize student mastery of transferrable skills rather than a narrow set of facts identified by teachers. This gives students more freedom to explore topics they find most interesting within a broad project theme. But in Finland, phenomenon-based learning is nonnegotiably interdisciplinary, something that can get left out of projects in the U.S. And it must be driven by students' own questions about the world, something central to another "PBL," problem-based learning.

Lisa Stamps states:

"Throughout the years, my students have completed many authentic learning projects, exploring topics that range from aviation to zoology. They have participated in many service projects to help solve community-based and worldwide problems. Students organized efforts to send money, food, and clothing to the poor in Honduras. They have tutored students and participated in community beautification and clean-up efforts. Through these activities, students also learned citizenship skills by taking responsibility for being productive members of our society.

At a young age, students enter school with a desire to learn. Authentic learning experiences fuel that motivation. What students learn, therefore, becomes all the more meaningful. Through authentic learning experiences, students don't simply receive knowledge; they attain it."

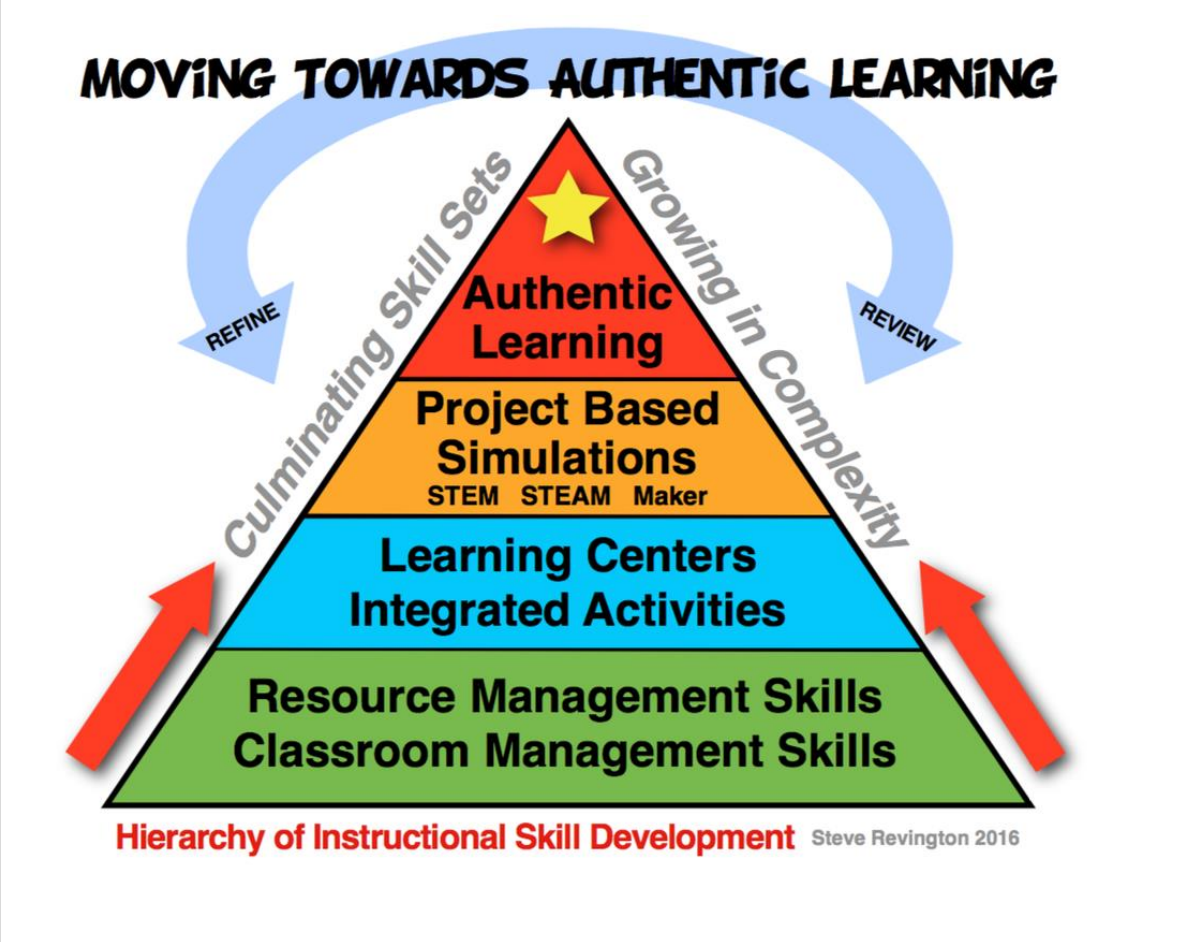
Lisa Stamps (lstamps@msms.k12.ms.us), a teacher of 10 years, is now director for academic affairs at the Mississippi School for Mathematics and Science in Columbus, Miss.

Authentic Learning

Steve Revington

Authentic Learning initiatives require a complex set of skill sets. Educators need to master resource and class management skills first, then introduce more complex learning initiatives over time.

Think about it. Every important, relevant thing a person requires to achieve a goal in life has a quality outcome or product attached to it. Pitching a business proposal requires an in-depth presentation that reflects relevance, meaning and purpose. If it's backed by tangible proof, even better. A prototype of a new invention requires a quality, tested, working device or apparatus to gain support in the marketing world. An environmental assessment requires extensive research and impact studies of connected, like-situations from around the ecological world.



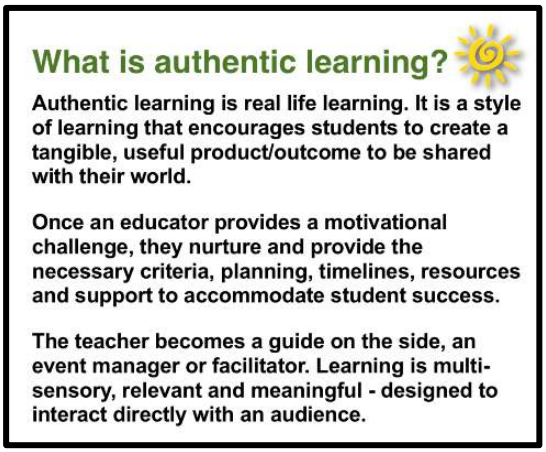
Findings

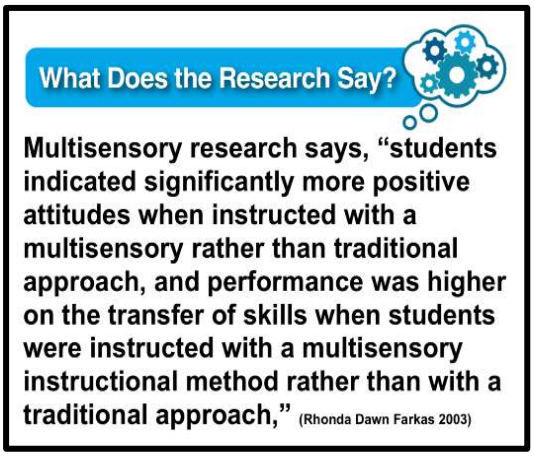
Steve Revington, Global Teacher prize – Top 50 Finalist

I visited Steve Revington, a passionate authentic learning educator who is now a motivational speaker recently addressed the third congress of international education 2019 in Argentina. The reaction he gets shows that teachers globally have a deep understanding as to why authentic learning is such a powerful strategy for learning for our 21st century learners and are looking for opportunities and professional development to support them on their journeys.

Steve Revington has deepened my understanding of authentic learning to a level I would never have reached on my own.

The following slides describe the concepts and elements of authentic learning that Steve has developed.

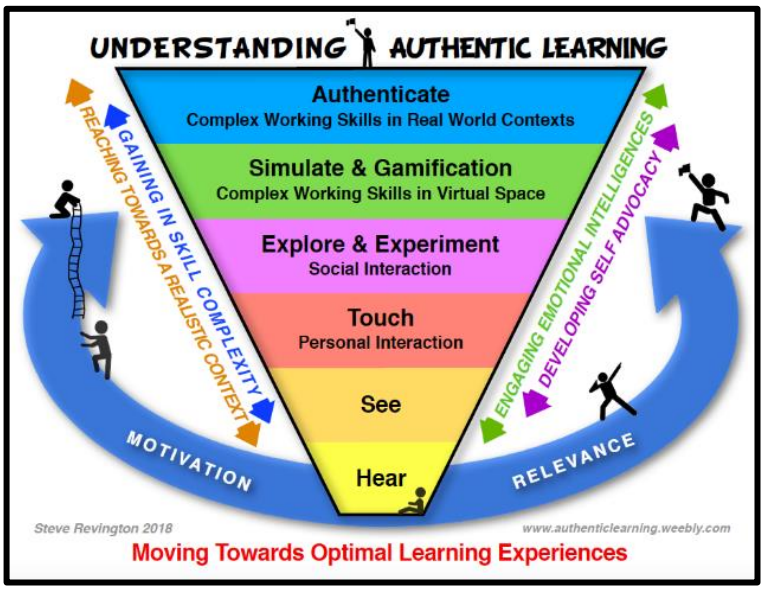




This diagram illustrates the key elements that defines how the depth of understanding develops as the layers intensify through the authentic learning process.

Hearing and seeing being the interface of our clinical classrooms.

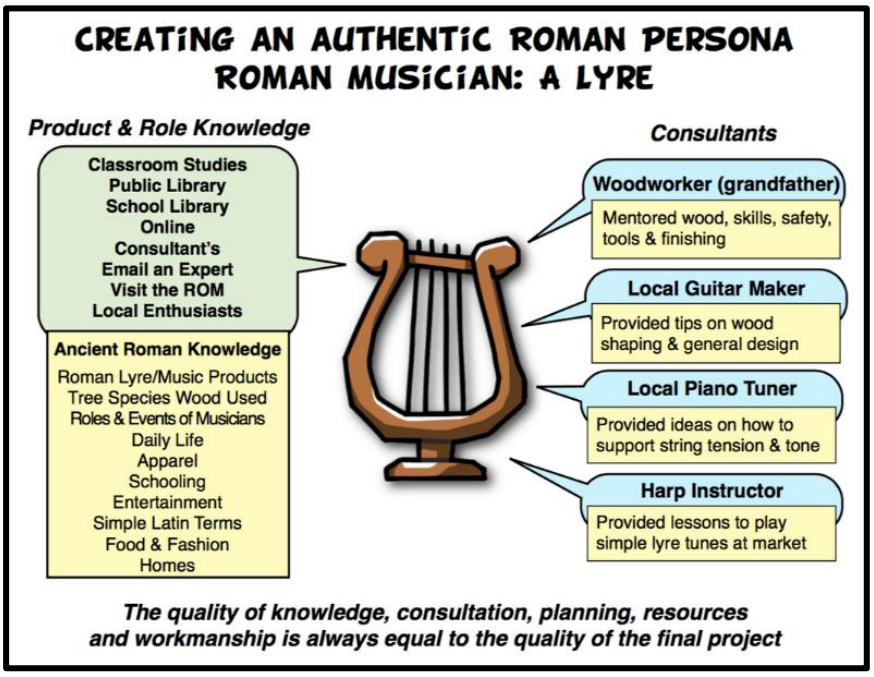
Note how motivation and relevance supports the learning. Without this, learning does not become intrinsic.



This diagram explains that delivering to an authentic audience, whether it is to a client, a letter or a performance, provides the platform that instructs the quality of the product, or the outcome.

Steve also states that the bigger the audience the higher the expectation and learning becomes.

Here Steve explains the importance of being well planned and well-read, to create an authentic learning pathway for your learners.



This image shows the process a student has gone through to produce an authentic Roman instrument.

Note the research and specialist knowledge acquired.

For this learning to be successful, support is needed from home, so Steve Revington created a website to communicate with parents.

A great connection is formed between home and school when supporting student engagement through learning. Student interest increases and supports their focus to develop an authentic product that is fit for a public audience.

LEARNING ARTIFACT COMPARISON

LEARNING	COMMENTS	LYRE 1	LYRE 2
Product Knowledge	The quality knowledge of products required to design and create an ancient Roman lyre.	low	high
Designing A Plan	A workable, succession of skill development to produce a quality authentic lyre.	low	high multiple levels
Goal Setting	Tiered goal setting plan to attain a specific, quality outcome over a reasonable period of time.	low minimum planning	high complex planning
Networking	The team of personnel required to successfully create a quality ancient Roman lyre.	minimal	two or more
Expert Consultation	Number of highly skilled experts who provided quality consultation and/or skill development.	minimal	two or more
Parental Guidance Support	The support provided to enable their child's learning pursuit safely through guidance, modeling and advocacy.	yes	yes
New Skills Awareness	The understanding of skill sets required in the process of researching, designing & creating an ancient Roman lyre.	minimal skills	multiple
New Skills Actively Developed	The skills engaged in directly when designing and creating an ancient Roman lyre.	cut & paste	high level, multiple skill
Transference of Skills	The skills mastered by actively engaging in the creative process over time. The learning processes that stick.	minimal	multiple
Experience Sharing	The interest and eagerness of a student's experience to share their story with others at a specialized level.	low level	very high
Genesis Factor	The seeds of understanding, processes, enthusiasm and confidence that will actively spawn new pursuits.	low	high

LYRE 1 Decorative cardboard and painted ancient Roman shaped lyre with ribbon strings. Cut and paint activity requiring a half hour of research and consultation. Basic template required for design. Lyre took a couple of evenings to create. Some parental assistance required.

LYRE 2 Working, near-professional finished wooden ancient Roman lyre. Complex wood support and bridge with working strings. Piano tuner, wood worker and guitar maker consulted as well as many online and library resources. Extensive planning and scheduling needed to create. Three and a half weeks of consultations, meetings and work sessions required. Two years later this student could recall many details in the processes of making his lyre.

S. Revington 2013

This diagram shows the difference between the prototype and the authentic instrument.

RUBRIC : Teacher design and assessment guideline

It is important to provide an assessment guideline for students to keep at the front of their learning journey folder, so their reflection is continuous.

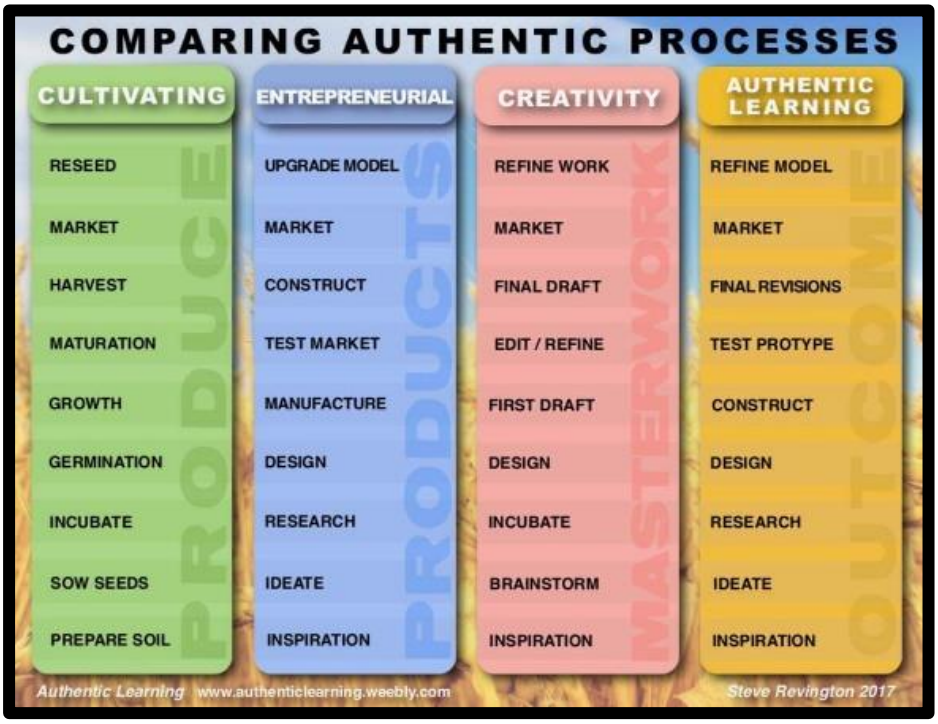
An assessment guideline supports each student's journey and provides an ability for both student and teacher to compare the product, for example, from a "cardboard" prototype to an authentically made product.

This learning process provides a deeper understanding of the journey that occurs when producing a product, and covers aspects such as purpose, research, design, review, redesign, refine, integrating for instance maths, literacy, science, health, enterprise.
Learning cannot be achieved effectively if the teacher does not know the end result from the start.

Having an understanding of the end product will help the teacher unpack the learning. Back mapping the learning journey will show the required student skills, expected curriculum outcomes as well as content information needed to create an assessment rubric.

Aligning the student's learning journey to specific achievement objectives, and having an expectation to develop a product fit for public consumption, will provide specific subject knowledge and skill development information that can be used to back map specific curriculum levels for assessment.

In this diagram we see 4 authentic learning processes; Produce, Products, Masterwork and Outcomes. The outcomes are aligned to the authentic learning product outcomes; Cultivating, Entrepreneurial, Creativity, Authentic Learning.



This slide shows how holistic development occurs as a result of authentic learning.

A checklist for planning an effective authentic learning event.

AUTHENTIC LEARNING ELEMENTS	Evident Yes/No	DESCRIPTION
TANGIBLE PRODUCT Tangible Product or Outcome	✓	The goal is to provide a quality, tangible product or outcome that can be shared successfully with a community.
COMMUNITY AUDIENCE Target Market the Product/Event	✓	The product or outcome is specifically directed, towards an intended, genuine audience. This provides the impetus for quality expectations.
DESIGN BACK PLAN Know what needs to be done, work back	✓	Establish what skills, knowledge, expertise & resources will be required to achieve success and make a realistic plan to attain the outcome for all.
WELL DEFINED CRITERIA Clearly Communicated Skills & Goals	✓	Once your plan has been established, clearly and succinctly communicate it. For each stage review & revise these. Be sure to share with your learning community.
ROLE PLAYING Assign Roles, Play Out Roles	✓	Students assuming themed-based roles heightens student motivation and aligns the team with a visual unity to reach the intended shared goal.
INTEGRATED LEARNING Evidence of a variety of subjects	✓	Subject expectations should be genuinely connected to the outcome & curriculum.
BLENDED SCHEDULING Transparent Timetable When Able	✓	Except for rotary subjects, scheduled subject times are removed whenever possible to allow for full student immersion to achieve a quality outcome.
COLLABORATION Team Building, Team Sustaining	✓	Team work is promoted and sustained. Students pool their resources and ideas to develop a successful product. Encourage team discussion & planning opportunities.
PERSONALIZED EXPERIENCE Open Ended For Free Choice	✓	Within the team plan of creating an event, students are provided with free choice pursuits that embody their interests. Independent, enrichment extensions can also be provided.
PORTFOLIOS The collection of learning artifacts	✓	Students file all relevant reading, writings, communications, storyboards, themed activity sheets, drafts, scheduling and research into portfolios.
MASTER SKILL SUPPORT Expertise, Networking, Resources	✓	Students & teachers will need to pursue expertise and consultation to attain skills and quality resources to support the authentic event..
PROFESSIONAL DEVELOPMENT Learn new skills, refine others	✓	Teachers may require skills & consultation outside of the school community to attain quality skills and be an informed advocate for student success.
OTHER Extensions	✓	Expert guest speakers, field trips, filming the event, creating personalized, theme related enrichment can also be implemented. New trends & relevant connections.

S. Revington 2016

School Visits

The USA Educational Management structure is different from NZ. A School District Board, which includes a Superintendent manages all the schools in the district.

This board consists of a member from each school in the district and manages the district's school funds. They decide on what the focus and goals are for the year. These may not align to the individual needs of schools and creates funding problems especially when the resourcing needs of the board compared to each schools' strategic plan and needs differ. This results in schools having wonderful resources that they may not necessarily need.

Superintendents find this frustrating, as they are the link between the board and their district's schools, often being the only ones understanding the specific needs of each school, and what their resource focuses should look like.

Principals do have a budget to run the school, but not enough to fund the extent of their actual needs. However, most schools, big or small, are well staffed. They also have more than adequate buildings, which includes PE spaces, halls, music labs with equipment, specialist teachers for these and teachers for learning support students.

Observation:

Schools here have excellent resources to run real life learning programmes as there are teachers available during school hours to deliver such programmes.

The authenticity of using a tribe member to deliver authenticity through culturally responsive knowledge and skills provides students with the sense of the real and belonging.

San Francisco Districts

Authentic Learning in the San Francisco area is situated more at a project-based level, with some schools and district boards implementing STEM and STEAM approaches. Some of the feedback was that district boards were only able to implement this pedagogy in schools where poverty, special learning support, etc. was not an issue. I posed the question of what strategies they use to improve student engagement. It became clear that instead of an authentic teaching and learning pedagogy, the strategy is based on a behaviourist model, using whole school PBIS (PB4L) strategies that drives learning and behaviour in schools.

When I inquired about authentic learning and student engagement, as well as the use of technology, schools were very excited to share some concepts that are beginning to happen in their schools. These projects are still loose standing from the curriculum, however, the idea is for teachers, to develop the skills to plan and implement an integrated curriculum using e.g., maths, science, technology, etc. Students then apply this knowledge to authentic learning experiences that may stem from curriculum work in class.

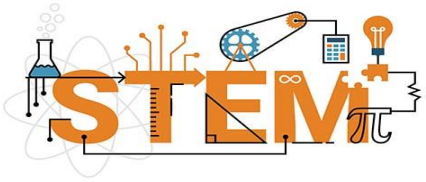
The implementation is based on STEAM and STEM and Maker spaces. The main difference between STEAM and STEM is that STEM explicitly focuses on scientific concepts.

STEAM is an educational approach to learning that uses Science, Technology, Engineering, the Arts (humanities, language arts, dance, drama, music, visual arts, design, new media) and Mathematics as access points for guiding student inquiry, dialogue, and critical thinking.

STEM represents science, technology, engineering and maths.

STEM vs STEAM: What's Better?

Janelle Cox

Science, technology, engineering, and math, otherwise known as STEM, has become a major focal point in today's schools.	

Individuals are now proposing that art be added into the mix to make STEAM, which would be STEM + Art = STEAM. The goal of this would be to take science, math, and technology and add an art component to it. This has led to quite some controversy and debate.

Education Weekly said it best when they said that it uses the knowledge of math and science in order to create technologies and solutions to real-world problems using an engineering approach.

STEAM.edu defines STEAM education as Science and Technology, interpreted through Engineering and the Arts, all based in Mathematical elements. This idea of adding the arts to STEM has recently gained a lot of momentum.

The "A" in STEAM doesn't just represent the arts but is more of a broad term that represents liberal arts, language arts, social studies, physical arts, and fine arts and music. It's basically a framework for teaching which is customizable and functional, hence the "fun" in functional.

It's not about spending less time on STEM subjects and more time on art, it's about applying creative thinking to STEM projects, and sparking students' imagination and creativity through the arts. It's about exploring where art naturally fits into the STEM subjects.

You can add some STEAM into STEM by applying design and computer graphics to projects or using the performing arts to communicate a STEM project. Students can utilize their artistic talents to generate innovative thinking.

*Janelle Cox is an education writer who uses her experience and knowledge to provide creative and original writing in the field of education. Janelle holds a Master's of Science in Education from the State University of New York College at Buffalo. She is also the Elementary Education Expert for **About.com**, as well as a contributing writer to TeachHUB.com and TeachHUB Magazine. You can follow her at Twitter **@Empoweringk6ed**, or on Facebook at **Empowering K6 Educators**.*

Benefits of Maker Education

Maker education makes it easy to connect learning across disciplines in ways that may not happen in traditional classroom settings. Through these connections, students are encouraged to develop critical thinking and problem-solving skills that will benefit them both in the classroom and in life after school. When students learn in a hands-on manner that engages them, they are more likely to remember what they have learned and more easily grasp deeper or more abstract concepts.

It opens doors for new methods of teaching and learning by combining a range of objectives into a single project. It allows the open-ended creation of a product that gives participants a choice in the execution and shows them that mastery can be demonstrated multiple ways both inside and outside the classroom.

Maker spaces look somewhat like a mini technology centre. It is fitted with tools and materials that are available to students during an allocated time to develop or create concepts that may have been designed as part of their integrated curriculum learning.

In most of these spaces, a paid facilitator runs the maker space and teaches there every day. This facilitator is not always a qualified teacher, more a person with a specific skill set.

Many schools are developing more project-based inquiry learning and moving away from learning only facts. Some schools have already been funded to create maker spaces to support learning with real life concepts and tools.

These descriptions clearly indicate that STEAM, STEM and MAKER SPACES support authentic learning.

"Give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking; learning naturally results."

John Dewey Philosopher and Educational Reformer

LINCOLN SCHOOL

Superintendent: Ruben Aurelio, West Contra Costa Unified School District

- Title 1 school: 95% + students with high needs (Financial, ESL)
- A school with high needs and the focus for students to be safe and emotionally well cared for is first and foremost.
- Main Goal: School space to be safe and tidy
- 29 -33 students per class
- Very well resourced: Buildings, teachers, specialist teachers, councillors that interact between community, school and kids; specialist teacher to observe teacher practice and develop teaching skills.
- Hands on learning for most students and children here are more focused on competition, games and puzzles.
- Their PBIS programme works on promoting student engagement by incorporating a competition element which is evident in all areas and everyone works hard to contribute to their own and their group's achievement.
- Celebrating achievements from testing are all intertwined with their PB4L focus. Wristbands, etc., students eating with DP (doughnuts, treats) when achieved something

Maths observation Year 6 class

A computer based online maths programme. The teacher sets a problem, and students work at their own pace to complete the task. Testing is computer based and provides good information on what they can/can't do.

Students said: " We practise the parts we can't do until we can do it then we help the others."

The programme is a great curriculum and assessment tool, providing readily available information for the teacher to work from. The computer programme provides the next steps making it easy for a teacher to follow. Computers are provided by the district board and this makes it easy for a teacher who wants to, to develop specific, purposeful content to support what students are learning.

Use of digital tools and devices

Authentic learning opportunities to apply learning to a real-life problem can make an enormous difference in preparing students for their futures and the way students learn.

From the computerised curriculum content, a teacher could plan real life learning opportunities by preparing hands on learning lessons. This is not a focus, but the digital programmes can show each student where they are at and each child has a computer. This is a great example of district resourcing but not necessarily used to support authentic learning experiences.

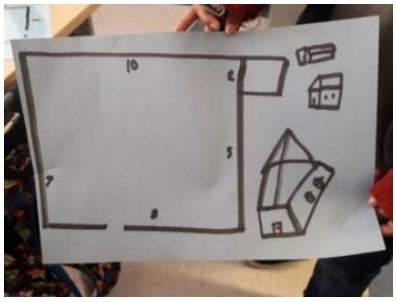
Authentic Learning Maths Observation: Year 3+4 teacher

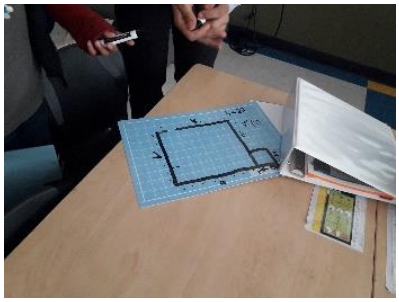
This is a great example of how classroom teachers can create authentic learning opportunities for students in their classes. However, this teacher's skill set was not understood. Careful guiding re assessment and a rubric to show expectations will develop this teacher into a very effective educator.

Design and build to scale, a space for the homeless - also integrated with social studies.

A measurement math lesson integrated with a Social Study unit on building a shelter for the homeless. It also integrated writing and reading.

For example, research the needs of the homeless, writing a brief of what they may need for a shelter – using their knowledge of spelling, sentence construction, etc.





This unit supported students to learn and apply abstract knowledge of number and measurement (cubic metres, volume, space, geometry) to hands on learning, giving the learning meaningful context.

Students were all engaged in learning and:

- Designed the shelter on paper to scale.
- Built the shelter to scale with interconnect lengths and connector building resource; Build the shelter from cardboard to this scale.
- Students used number, geometry to work out what they are creating.
- They used and showed an understanding of the knowledge required to a higher level than required.

Assessment feedback

- Teacher still needed to work out how to assess the skills from how they planned, worked out, etc. using numbers, etc. (Back mapping could be an option.)
- Teacher needs to have a grid with what Year 3 + 4 level maths require, e.g. in number area, decimals, geometry, volume, etc.
- Should also have the higher levels on the grid to identify the extended understanding these students have achieved.

OLINDA SCHOOL

Play based focus - supports authentic learning through play

- West Contra Costa School District
- More affluent requiring less intervention
- Play based learning a focus and highly supported by the principal.
- Yr. 0 Teacher provided experience for excavating fossils.

	Choc Chip Cookies and tweezers. They were learning how to excavate – using little tweezers and brushes to get the choc chips out of the cookie. This helped them to replicate and understand how fossils are excavated and how carefully it is done not to destroy anything.

SHANNON SCHOOL

Behaviour management focus to support student engagement

- West Contra Costa School District
- Major Focus on behaviour - Very well resourced with people on playgrounds all the time to teach and resolve issues from Playworks programme.
- Playworks development: Students play paper scissors rock - when there is an argument that is not resolvable. This teaches them that sometimes there is no rhyme or reason and they have to build resilience to accept the outcome. (Conflict development)
- 5 Minute lessons on foundational skills after lunch.
- Consequences: Logical – not punishment. Consequence marry up to problem – provide a task. Also, Mindfulness, Toolbox – zones of regulations, vocab development and restorative justice
- Theory of actions
- The school has a centre where they teach foundational skills. Automaticity is the goal. These programmes compare to what RTLB does in NZ.
- Social support - helps teachers feel nurtured to do their job
- Bell transition time: When bell goes – they freeze – they stop and think about where they must go now – thinking time to go to class. No dramas during transition time anymore. A bell goes again to release them from freezing

WAGNER RANCH ELEMENTARY SCHOOL

Annual Maker Fair: Opportunity to work with materials provided

This school prepares for a maker fair each year. It provides students with many different "maker" experiences and introduces them to some innovative and fun materials and resources. It is run across 3 days to provide each classroom a timeslot of about an hour to participate.

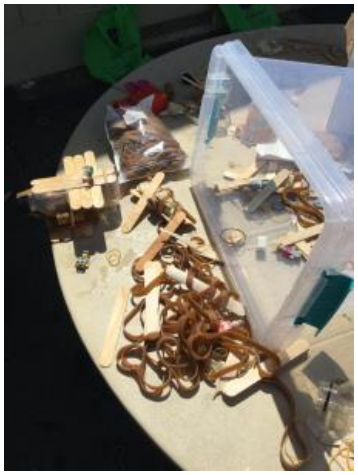
Observation

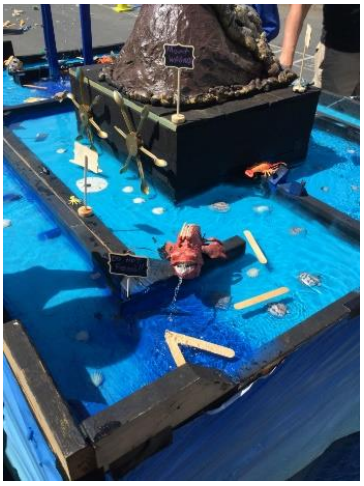
If the experiences were to be directly connected to the classroom curriculum, the science concepts from the maker fair would develop rich, authentic learning.

However, the fun activities for students to have a go at, still provides an enhancing experience.

The amount of money needed for all the resources would be significant:

- 3D Pens
- Fooze balls
- Kaleidoscopes
- Robots
- Life savers
- Roller coaster
- Noise makers
- Box construction
- Marble wall
- Water table – students made floating craft with empty plastic bottles



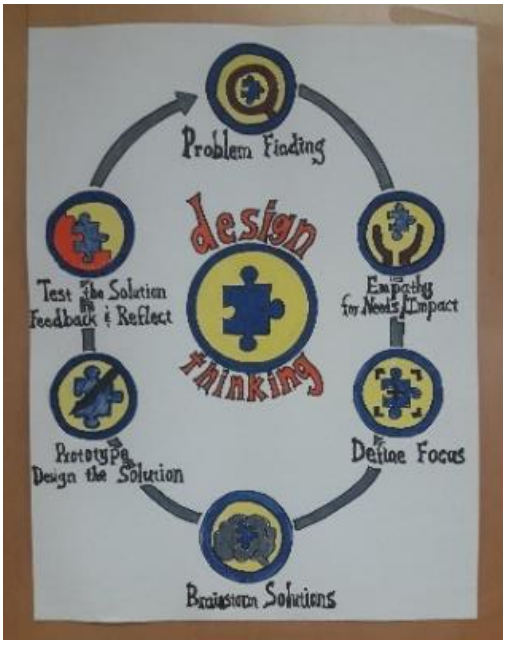


SLEEPY HOLLOW SCHOOL

Here the school district identifies a PBIS (PB4L in NZ) theme for the district schools and supports development of these focus goals for all their schools each month.

Schools then develop these goals in the way that suits them. It is said affluent schools' goals look different as they have the time to focus on enrichment programmes like STEAM, the arts, etc., because they do not spend all their time on behaviour, social issues, etc.

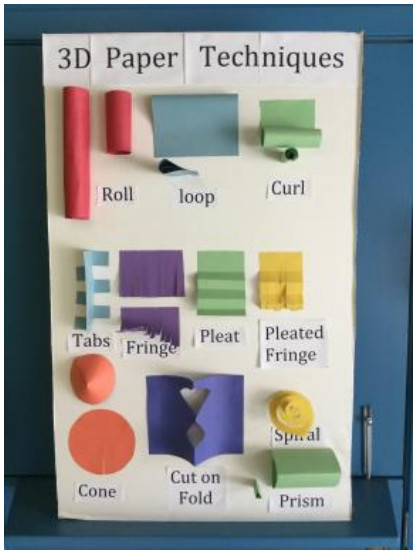
They also have the money to provide these lessons. All classes have a COW (Computers on Wheels) – funded by the district, not the school.

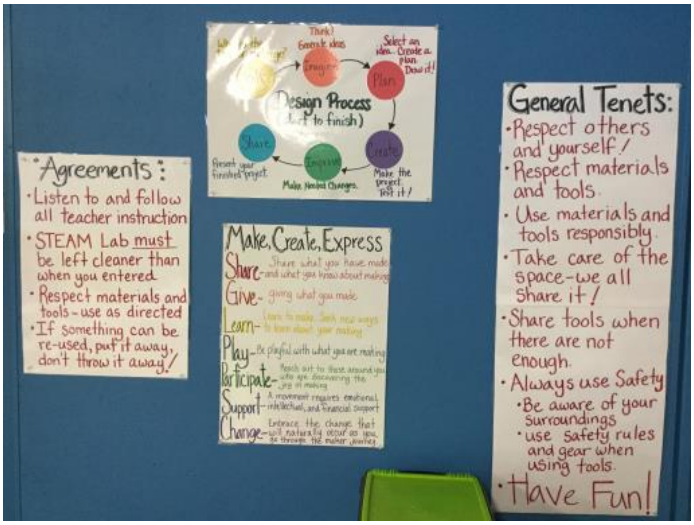


STEAM Labs are currently being built in these schools and are district funded.

A STEAM lab is like a mini technology classroom, staffed with a teacher or expert aide that runs the lab and is there all day. Students attend in groups or as whole class.

Below are some photos of information on the classroom walls.





Portland, Oregan, USA

SILTEZ VALLEY SCHOOL

- Professor Micki Caskey (Coordinator)
- Principal Dr Sam Tupou

Cultural responsiveness

The main focus of this school too, is to develop a coherency between the community, the students, staff and school ethos. PBIS (Our PB4L) principles plays the main role in establishing this. Incentives for attendance and achievements are paid for by the school.

The school's logo was under threat because the government was trying to put a stop to people using Native Indian American emblems when they did not have a school roll reflective of this group. Siletz Valley school had to apply to keep their logo (an Indian head with a warrior headrest made from feathers). They won the battle and had a very big design made for their gym floor. It is a very important, iconic emblem for them, which generates much pride in themselves and their school.

Problem

An ongoing concern for the school is that the Siletz tribe gifts each tribal member a rather large cash amount when they turn 16. A high percentage of this Native Indian Tribe students attend the school. Many students plan to only stay at school until the day they receive that money. Although the intent is to support their young people's futures, the tribe has no regulations as to how this money should be used. Therefore, a lack of guidance, good modelling and maturity results in many of them making poor decisions. It was noted by the principal that car dealerships inflate their price around this time.

Authentic learning and cultural responsiveness

The tribe from this area has only 10% speakers of the Athabaskan language left. This poses a problem as the language is an integral part of cultural identity. Siletz Valley School is now the main site for the pilot project of the Siletz Tribal Language Project (Confederated Tribes of Siletz Indians).

In 2008 the project received a grant from the Administration for Native Americans, making possible a combined effort to address the status of their Athabaskan language.

A cultural and language teacher was appointed and is learning from and working with the elder from the area who can speak the language. They teach this elective to students in the high school part of the school.

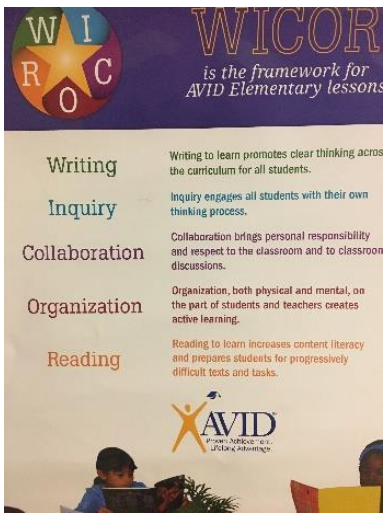
The programme is based on authentic cultural cooking and crafts. Students are learning traditional crafts and meaning of beading, etc. They learn to cook authentic food, and the history of how food was gathered and grown. Using these authentic experiences as a vehicle, students learn to speak the language.

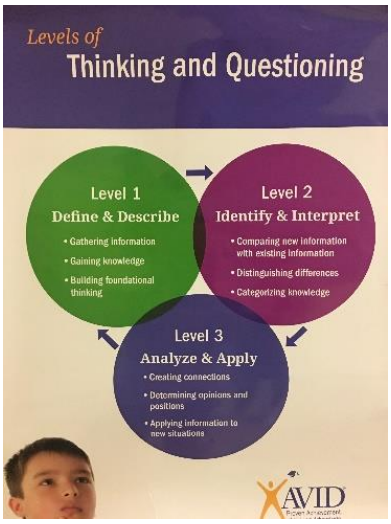
2019 was the first year that this programme was offered, and many students are electing it. Having a community member, who is from the ethnic group, who carries the pride for the tribe, provides reality and relevance for the importance of what the students are learning. *(Knowledge keeper)*

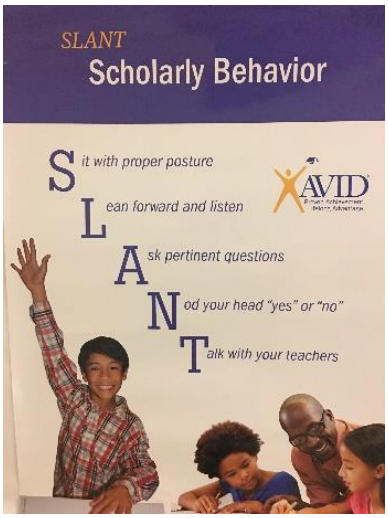
Avid Programme: Advancement Via Individual Determination

Siletz Valley School also implements the Avid Programme in conjunction with a PBIS (Positive Behaviour incentive Programme)

The Avid programme is dedicated to closing the achievement gap by preparing all students for college and other post secondary opportunities.







Some prizes and incentives relating to the AVID and PBIS programme at Siletz Valley School

NIXYAAAWII COMMUNITY SCHOOL

American Indian Reserve

The school operates like any standard school with some reference to a basketball sporting culture. Their basketball team has a culture of winning and they aim to sustain that. Many students do not attend school often.

Many live on the reserve, some live outside of it. The school has amazing school-, technology- and gym buildings and resources.

An authentic programme is taught by a fully funded teacher and is an interesting elective. This is a result of a grant gifted to the school to support student causes. Students work through a process to problem solve a real-life challenge.

A panel of students (under the teacher's guidance) had to create criteria for applications from student bodies to apply for the money; they read applications, had interviews and decided who got the money.

Students told me they have learnt what is required in real life when applying for something, whether for money or a job. They understood why people set up criteria and how decisions were made. I observed that there was no expectation for accountability of how the money was spent afterwards, no report or outcome expected.

Having a teacher to teach this as part of an elective indicates the great possibilities authentic learning has in this system due to effective teacher resourcing.

The school's maths programmes are computerised. Students enjoy the tool but it still only provides an abstract maths problem to solve.

The computer can draw 3D objects to help students "see" what the reality looks like and can be manipulated – but it is still only a picture and abstract.

Cultural responsiveness and authentic learning to develop their culture

The region's tribe has an amazing museum (Pendleton area) – show casing the history of their culture and life. A lot of work and money has gone into preserving and show casing this.

The tribe also owns a casino, which generates substantial income. Funding can come through this avenue to support the growth of cultural responsiveness through authentic learning experiences for their youth in schools.

Some schools have discovered the importance of authenticity of those elders who know the culture to support them in the delivery of such content.

CORBETT SCHOOL

Dr Randi Trani (Principal and Superintendent)

Even though Dr Trani is both Principal and Superintendent, his hands are still tied as the district must vote how the ratepayer's money can be spent.

The school's main block is not earthquake safe and contains asbestos. It is situated in an older community with no vested interest to vote for the school as their children have already left home. The school needs their vote for funds to be directed to the school.

Corbett Primary School Runs a 4-day week. This gives children more time at home to do family-based activities or sport.

The school has a whole school themed approach which is developed around the Columbia river, which snakes its way through Oregon. The river is a well embedded part of the community and its history, which provides a very successful authentic learning resource.

There is a clear vision which includes:

- Focus on student teacher relationships – by keeping students 2 years with a teacher
- Whole school project based (The Columbus river – 3 year rolling curriculum)
- Not test heavy. Manipulate curriculum around the tests expected
- Meet each student at their level – differentiated learning
- Library dissolved – all books distributed across the school. Books they buy now compliment the themes of the different syndicates and are bought to suit the levels who require them.

- The river theme flows through the primary school, depicting different aspects of the river in each year level. There is a specific area of importance of the river and align/integrate their curriculum subjects to it.
- Teachers level it and teach to it.
- Themes around the river change regularly. E.g. Middle ages. Middle ages fair is a common event. E.g. Everything is focused on the middle ages. Speeches/poetry of middle ages. Teachers level it to each level's need.
- There is always a school presentation in form of an event to show case this learning and completed achievements.

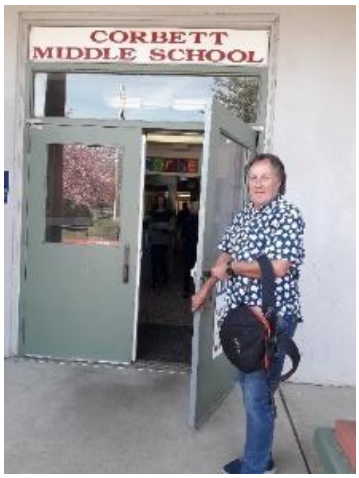
Intermediate

Intermediate students were shifted to their own building. Dr Trani says they need to be a community of their own. They are called the Year 8 + 9 academy.

If a school is too big, it loses its character; children gets lost, Dr. Trani says. Therefore, he places smaller cohorts in different buildings where they operate as individual units or "schools".

A small school is key! You cannot have relationships with 900 children in a school.

This identifies again the importance of building personal relationships to support student achievement.

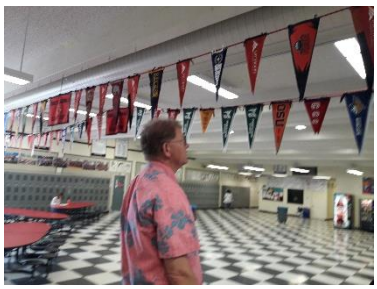


High School: CAPS (Corbett Advanced Placement)

To graduate from this high school – students have to be enrolled in college.

All students leave school with a vocational pathway – a focus - pictures up of all students' universities, etc. Students are supported to apply.

- The school follows the AP (Advanced Placement Programme) it is a college preparation programme.
- Advanced Placement (AP) is a program in the United States and Canada created by the College Board which offers college-level curricula and examinations to high school students. American colleges and universities may grant placement and course credit to students who obtain high scores on the examinations.



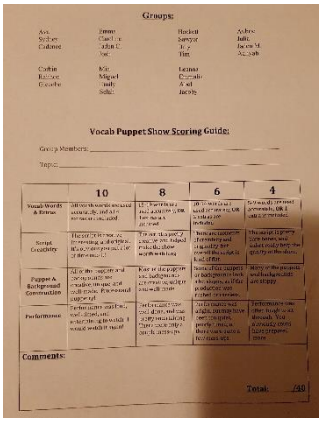
- Theme for the High School is called College Prep.
- The goal is 100% graduation – currently it is 92%
- Teachers do not work from handbooks.
- Teaching and learning focuses on inquiry but at the same time, students are given a rubric of expectation and levels that provides achievement guidelines for quality of the task.
- These criteria must be met during inquiry learning – teachers need to provide at the start, the structure/pathway that students must work through to achieve the outcomes.
- The outcomes are levelled, so students can see what completion looks like for 5 points, compared to 3 points for each of the criteria.

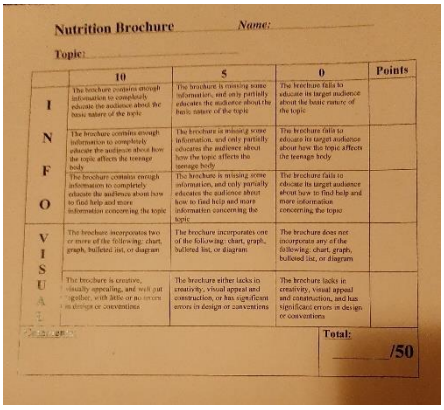
Students have a break between each exchange of class – 5 minutes. They can talk/visit with their friends, etc.

- There is a low focus on national testing. School still has high achievement levels at graduation. The tests they do write are from the AP programme.

- The high school expects from parents to keep their children in the school for 4 years.

Here are examples of a learning journey and an assessment rubric.



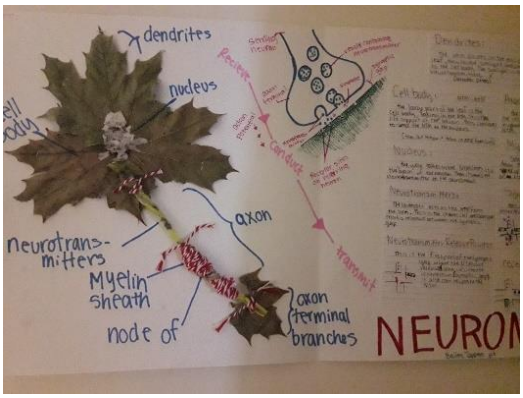


Reporting at Corbett School:

- Narrative style
- Rubric must be achieved. These not always included in report
- Report every 12 weeks.

Dr Rani has implemented a vision of holistic education with specific focuses to make the building of relationships possible and a focus. Smaller cohorts (separating junior, middle and senior schools into their own buildings) and staying with one teacher for 2 years are some of the initiatives. Relationships are key. No handbook teaching.

Having a high expectation for high school students, expecting of them to have enrolled in tertiary education before they may graduate from Corbett School and implementing the AP (Advanced Placement) programme to support that, have increased the graduation rate as well as high achievement levels in the district.



It is interesting that most of their implementation is based on a NZ system. No handbooks – only teacher generated planning.

The Arts and Spanish School at Corbett

This was once an empty building until there was a request in that specific community for this type of school. A great example of how the community's requests were listened to. Dr. Trani, as Superintendent of the district, was the leader in developing this school.

The focus is on the arts and learning to speak Spanish as part of real-life learning. Students do dramatic presentations in Spanish.

Authentic language teaching

Spanish teachers must speak Spanish and be qualified to teach this subject. There is a class where most of the class is run by predominantly speaking Spanish. Students answer in Spanish, therefore learning the language through conversation, rather than only linguistic instruction.

Authentic Learning Outside

There is an initiative around developing the outdoor environment (a few hectares of bush) that surrounds the school. An Environmental group is paid to tutor classes each week and support the development of growing produce and making products. Each class has a different focus of learning.

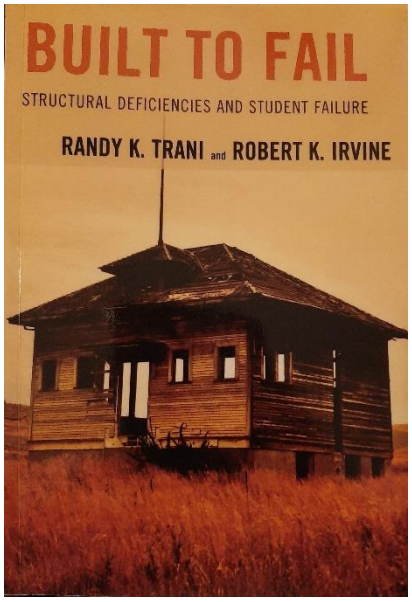
Students sell their flowers/vegetables – working through an authentic cycle of growing, produce, product, enterprise.

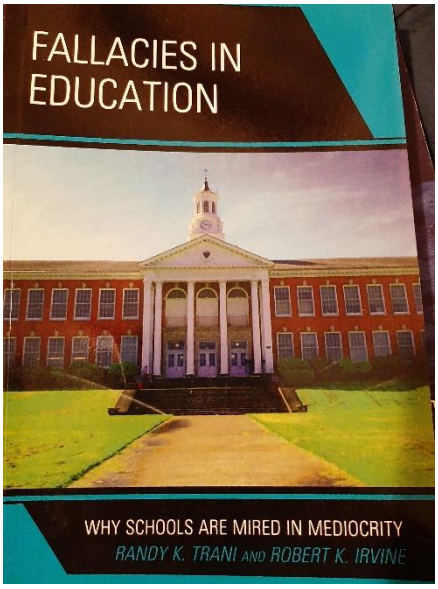
Students also cleaned up a stream that runs through the property.

Authentic Learning implementation

Resourcing is again the important factor here. Teachers follow up in class on the learning, but the hands-on learning is taken care of by an outside body which supports sustainability and consistency.

Two of Dr. Trani's books that discuss challenges he sees education facing.





ROBERT GRAY INTERMEDIATE SCHOOL

This school is a firm believer that Intermediate students need to be taught organisational skills. The AVID programme has this feature and helps students prepare themselves to self-manage their gear and time.	

Avid Programme (World wide - $10,000 per school)

- Scaffolds students
- Develops executive functioning
- How to get ready
- Develops student engagement

Staff meetings

- AVID focus on:
- Culturally relevant teaching
- Students in intermediate: high levels of executive functioning disorder
- AVID can build resilience – it provides skills for life

Student Engagement

The schools in the US all seemed to have a focus on a behavioural concept/goal which they further developed to create cohesion around expectations for behaviour, and social behaviour between peers and adults. This concept is also implemented to drive student engagement. The Avid programme is an example of this.

Second to this were focuses for hands on learning programmes – of which project-based learning, STEM, STEAM and Maker Spaces were the major focuses.

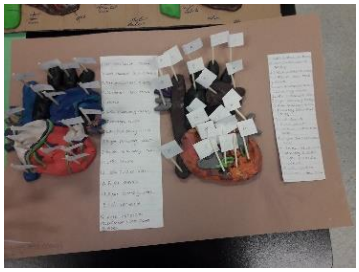
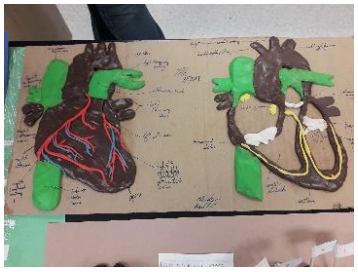
The curriculum content is prescribed and does not leave much room for a school to broaden or change content to match the skills students are expected to learn.

Canada

VAN DER HOOF – BRITISH COLUMBIA

Van der Hoof is a small town in northern BC, Canada. The high school is the hub of the community, with the principal, Mr Ken Young who is open to integrating authentic learning in the curriculum. The Biology and Science teacher, Mr Casey Litton, is passionate about authentic learning and is dedicated to providing students with real life experiences to broaden their knowledge and understanding.

Below are some examples of different approaches in teaching, learning and assessing the biology of the heart.

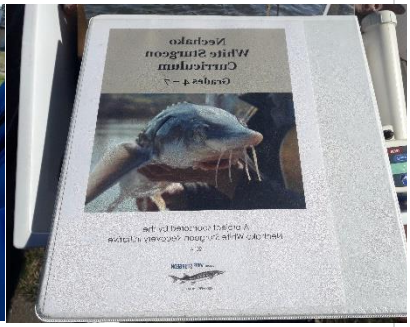




Sturgeon project

The High school students' science and biology curriculums are integrated with this project.

The photos below show the region and the facility where the breeding programme occurs.

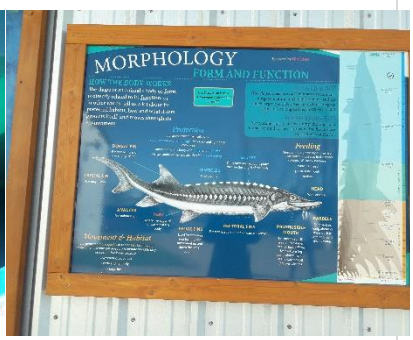




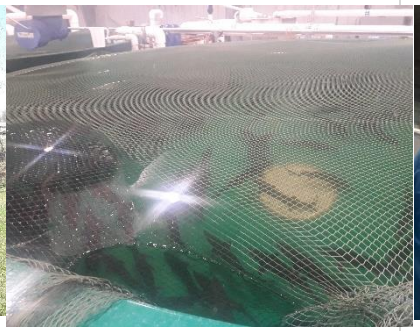
Students work closely together with the university and marine biologists on catching, breeding and growing sturgeons, and releasing them back in their river.

Below shows an example of two breeding tanks, and if you look closely you will see a very large sturgeon.





Students visit the university to listen to presentations and have been invited to present to university staff at the same forum.



Objectives from the curriculum are matched with these authentic learning experiences and developed so the achievement objectives are reflected for assessment purposes. More subject areas are integrated as the need arises, eg. ICT, film making, etc.

Students with strengths in different subject areas are given the opportunity to learn to work together and use the strengths of others to create presentations of high quality. They produce a product fit for presenting and publishing to an authentic audience, in this case university professors.

Waterways Project – Murray Creek Restoration project

This project will support bringing the stream back to its historical channel and will harbour a more fruitful riparian habitat.

Authentic learning in Science, Biology, maths, social science, environmental education and citizenship is supported through this collaborative approach between the school and community.

The stream monitoring program was established in 2017 as a collaborative pilot project between UNBC, School District 91 and the Nechako Environment and Water Stewardship Society. The program satisfies curriculum requirements through experiential learning while simultaneously increasing student awareness and activism on local environmental and community health issues. Casey Litton, the teacher championing the program at the Nechako Valley Secondary School, has a vision the waterways monitoring program will, "enhance student investment in their school and community, and allow them to become stewards of the future."

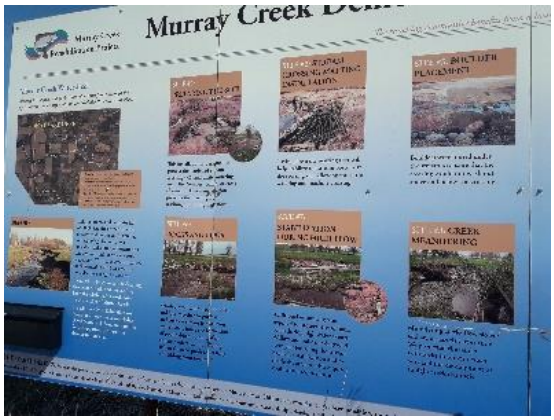
A Science Teacher at the Nechako Valley Secondary says, "This program has given students, teachers and different departments an opportunity to collaborate and see a greater purpose in education, while also learning about our place." Also interviewed in the film, Wayne Salewski, Chair of the Nechako Environment and Water Stewardship Society says, "Fifty percent of kids in School District 91 live in the country, so they are the influence that will take this message home to mom and dad. That is where the stewardship change will come from, it will be driven from the kids upward."

The project has provided impetus for an expanded, long-term collaboration called "Koh-Learning in our Watersheds", which was launched on February 25th this year. The new phase of the project will focus on connecting integrative science, Aboriginal education and more active collaborations with community and research initiatives across School District

Students work with farmers and the council on cleaning up waterways as a pre-requisite for the survival of the sturgeon, students in the intermediate years' work on testing waterways, opening waterways to flow again, checking aquatic life, etc. - ensuring the sturgeon can spawn naturally in future because water conditions are being improved.	

Students learn about attitudes of farmers, financial implications to farmers who must spend money and effort to support these efforts as well as the cost involved in keeping cattle clear from waterways, etc.

These noticeboards have been put up showing the collaborative action between the school and the district.



Jordan Cranmer, a grade twelve student and the student lead on the project remarks, “This project has been about following a story that you didn’t know from the beginning, it has helped me learn so much and realize how connected I am to my community.”

Grade twelve students Chris Penner and Sydney Seymour, the video, editing and sound production crew, will be using this film for their application to the Digital Film-making program at Kelowna’s Centre for Arts and Technology.

Ella Parker, a Mitacs Career Connect Intern with UNBC’s Integrated Watershed Research Group (IWRG), graduated from the Rivershed Society of BC’s (RSBC) Sustainable Living Leadership Program (SLLP) in 2018 – this film is her completed SLLP community sustainability project. Ella was overseeing the project and says, “The video camera became a tool that allowed students to ask questions about their environment and their community, and through this process, they landed on a really meaningful and relevant narrative about the importance of our connections to our waterways. The student film crew has done an amazing job of bringing this narrative to life through the filming and editing stages of the project.”

Flight Simulator Project

This was an excellent opportunity taken.

The principal heard their airport was going to remove this resource from the town as they could no longer rent the space, because nobody was paying to come for lessons.

The principal offered to house them at the school for the flight school to use there.

In return, students can now start their first level of flight training free of charge.

One of the teachers is a qualified pilot and takes the elective for students on this course.

This is providing excellent real-life learning to apply maths, geography, science, etc. to real life learning – providing a purpose for using these subjects as part of their learning.

This is the flight simulator in the school.

Saskatoon

- *Culturally responsive practices aligned to authentic learning.*

Belinda Daniels, a teacher of Cree language, is another global award teacher.

She was awarded this for her work in providing environments during school holidays for Cree tribe members to participate in a culturally responsive environment.

They learn to speak the language authentically whilst cooking, making crafts and experiencing cultural life in a traditional setting.

Belinda also teaches the Cree language at high school level. Her classes are based on a high trust model and she shows an understanding for the socio -economic challenges her students may be facing.

Students can be late for class as difficult home circumstances and having to work to help financially and then coming to school afterwards creates difficulties.

Students can walk out of class if they are upset or bored. The teaching model allows for a safe emotional space for the needs of teenagers.

However, this can only happen when classes are as small as they are. (6 – 10 students at a time). The school's resourcing for this programme is excellent as it also involves a social worker and a knowledge keeper from the tribe. Students become more open to understanding who they are and what their culture means to them. They are encouraged to take responsibility for their futures and develop the skills to support the sustainability of their tribe's culture and language.

Belinda uses sign language while talking - it provides a mind picture and makes it easier to remember a new language.

Teaching a language and cultural responsiveness is authentic when taught:

- By someone who can speak it and is a qualified teacher
- By someone who is of the culture, eg. CREE and can perform rituals, for instance smudging to develop understanding of spirituality and meaning of it
- By someone who when teaching knowledge of history are careful not to be overly political – to provide an open forum for students to talk about how they feel about the way their tribe was treated, how the wars affected their life on the land, etc.
- And school pays for a traditional knowledge keeper, scheduled to go to classes each Thursday morning.

The school also owns land and developed an institute that provides an authentic camp environment for students to participate and learn Cree traditions and language at.

Students stay over for a camp and do all cultural activities of the Cree tribe in an authentic way. Other schools pay to use this facility too.

Belinda's initiative for summer camps have developed and expanded across the district. She has staff employed, they find grants and have a significant impact on first nation children.

(Culturally responsive language acquisition)

Conclusion

Maraes could be providing this environment in NZ, but nobody staffs them, they have no money and schools can't own them.

These photos show some of the learning areas at the authentic learning complex available to all schools in Saskatoon, Canada.

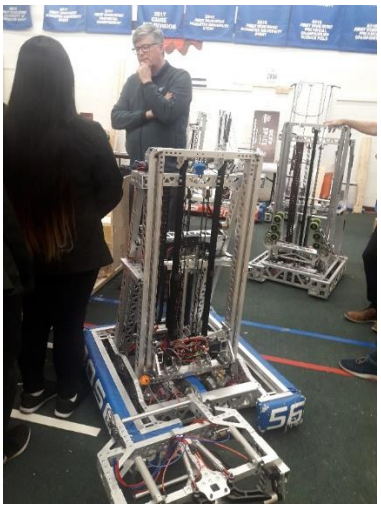
ORCHARD PARK SECONDARY SCHOOL, STONEY CREEK, ONTARIO

- *Robotics programme – providing another platform for authentic learning*

Programming is taught in programming class, building smaller scale robotics where students learn the principles of robotics.

A passionate teacher provides a platform for students to apply their knowledge to build functional robots and programming them to perform certain functions as part of a national competition.

Students may apply to join this after school club which consist of huge teams. Student knowledge, skill and interest naturally provides them with a specific role. Beginners learn and help the Designers, Builders, Testers, Drivers for the competition.



Their success has provided the school with kudos and the ability to generate funds from the local businesses etc., to continue with this hugely expensive programme.

(Robots, trailer to transport, fees to compete, accommodation costs, etc.)

Most students who are in the club are very sure that this has led them to what they will choose as a career path. They have worked with the public sector in the design, creating parts with engineers, etc. providing authenticity and purpose as part of their learning journey.

USA, New York

THE BRONX, NEW YORK: SCHOOL CS55

Stephen Ritz - Green Bronx Machine, Global Teacher Prize: Top 10 finalist

"Teaching happens in classrooms, but learning happens in the real world."

(P261) Stephen Ritz

Visiting this school in the Bronx, New York was a highlight of my travel.

It was a first-hand experience of what can be achieved whilst working in an area with very few resources, with a community and children deprived of many basic needs.

Stephen Ritz developed his vision and ideas while teaching. He saw how powerful authentic learning was in bringing communities together, helping students believe in something, helping students working together to achieve what they set out to do and how this impacted on their lives in later years.

"I wanted to transform an outdated and underutilized library space into the first National Health, Wellness and Learning centre, retooled for the future, with hands-on learning for student and on the job professional development for teachers. It would be a living lab to benefit everyone."

He decided to develop a classroom into an authentic learning centre teaching science to all classes. Class teachers attend alongside, which creates an integrated learning pathway for both students and teachers.

By being part of this teaching strategy, integrating relevant subjects and providing opportunity for deeper learning; teachers here realise how authentic learning supports meaningful and purposeful learning when students are given the opportunity to apply their knowledge to real life learning opportunities, often extending knowledge to higher levels than required.

It also shows the development of skills required for the workplace in the future.

"Little farmers eagerly pushed seeds into seedbeds and waited patiently for them to germinate under growing lights. While they waited, we learned to make predictions, fractions, and calculating percentages. Every day, there was a detailed lesson plan behind each adventure, carefully mapped to academic learning goals. " (p 180 -181)

Stephen knew the school principal of CS55 in the Bronx and offered him his services. He brings his own salary through fundraising and to help these underprivileged children learn, eat and be at school.

As a result of his work he also managed to open a public health room at school who anybody can visit for free every day.

The entrance to the school and some examples of learning science in the class room.

Stephen is the resource that supports teachers in the school to implement this authentic style of learning. He turned his class into an authentic learning science lab, with hydroponics, bicycles that creates the power when kids are cycling, a mobile kitchen/recording station, etc.

Authentic Learning model: The Bronx, New York

Stephen wrote a science curriculum implementation plan aligned to achievement objectives but focused on the plant. He states, "comply with assessment requirements otherwise this pedagogy will never be accepted".

".....while that curriculum is driven by my passion for health, wellness, nutrition and gardening, it is grounded in what I have learned about effective, engaging instruction and the use of data, assessment, student voice and choice, and constructive self-assessment and feedback that helps all students and all teachers succeed." (P 255)

His curriculum for Science is developed around real life experiences: to grow food, feed yourself and enterprise.

"Disciplinary issues dropped by more than 50% that first year". (p188)

"Academic results, including the best improvements in science scores for elementary students in the city, showed the measurable benefits of learning in a green classroom. New teachers were applying in droves to join a school that had previously been dogged by a variety of staffing issues and poor morale." (P 206)

Vegetable gardens outside.

The first planting happened outside the school and suddenly elders of community arrived to watch over them. They were not asked, they just loved growing things

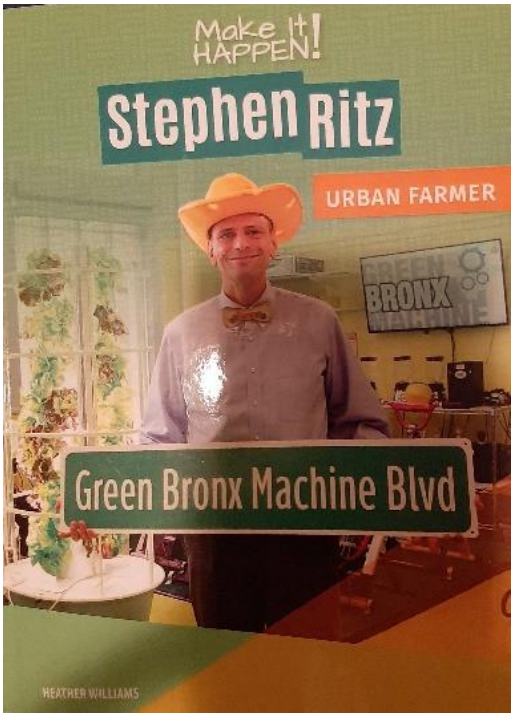
This resulted in all drug deals vanishing from around the school as kids who were dealing did not want their grandparents to know or see them. (Respect within family)

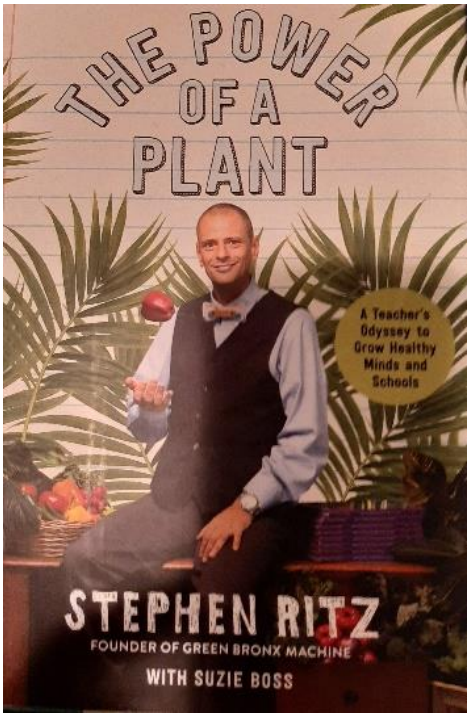
"After years of trial and error, all the pieces for true community-based learning were falling into place, right here in the heart of our projects. Outside the front steps of CS55, we had outdoor gardening containers decorated with children's art and benches where people from the neighbourhood could safely congregate among the greenery. Inside, the National Health, Wellness and Learning Centre was fully equipped as a demonstration site for active learning across the curriculum."

A strong unified message and atmosphere was created by designing the whole school's colours and interior painting to reflect the different class level's participation. Juniors – Rivers, flowers, mountains, etc.

This provides an uplifting, tidy and happy surrounding. Students like being at school and attendance levels increased considerably.

".... I am determined to wrap schools, content and subject-area instruction and the entire academic experience around project based learning and deep, authentic learning experiences that inspire healthy living in line with people, planet and twenty first-century opportunities." (P 252)





Stephen Ritz' books are inspiring and provide excellent guidance to teachers who are interested in how authentic learning changes lives. In his book "Make it Happen" he provides information of what to collect, do and create to make the lesson happen.

He understands that teachers starting out do not always realise what to collect for a lesson, and his book "The Power of a Plant" reads like a blog from when he first started teaching.

His success shows that students who have developed the confidence and knowledge they can use to make informed decisions of their yet unknown futures. A continuous and sustainable development of self.

USA: Burlington, Vermont

UNIVERSITY OF VERMONT, TARRANT INSTITUTE

Penny Bishop, Implementing Curriculum for "Developing Personal Learning Pathways"

Tarrot Institute, Founders / Plan:

- The State of Vermont supports the development of an educational pedagogy of personalised learning plans to incorporate real life learning.
- Programmes are being put in place to support schools to start implementing these PLP's in different ways.
- Some schools allocate leadership responsibilities at school to develop citizenship and leadership
- The UN goals are used by teams of students to develop their Personalised Learning Plans. (PLP's). The UN goals become the overarching theme schools use to get all classes working on their PLP's. This creates a common goal which is important to the community, district, country and globe. See page 51.

Outcomes from this developed:

- Bringing/ connecting real life learning to the curriculum
- Developing skills needed for life
- Different schools identify different ones. Eg. Montpellier's TRY and Youth Climate leader badges. (Communication, self-direction, etc.)

CROSSETT BROOK MIDDLE SCHOOL

- *Programme to support hands-on learning for sustainability /recycling*

Life Legeros, Tarrant Institute advisor for sustainability learning

Co-op programme: The school employs a Co-op teacher and the programme focuses on sustainability. They keep chickens, do crafts from recycling, design outdoor learning spaces, etc. Different classes do different things. There is authenticity built into these activities as students participate in the care of animals, creating living spaces for them and applying their knowledge to do so. However, this elective is only available for short bursts of time, so students don't have enough time to participate in complete real-life cycles of learning.

Students chickens and chicken coop designed and built themselves.. Also reusing and recycling materials to create things like jewellery - a product fit for " public consumption."

History teacher: This teacher showed an amazing ability to personalise the learning of history through integrating with subject areas like the arts, literacy, music, etc. This shows how teaching the reality of history can be personalised with amazing intrinsic ideas. A rubric provides the expectation to be met, but students could produce for example a song a poem, etc. (but no posters!) to explain their research. The concept is that history must come from the inside out providing an insight as to how what happened in history, affected those people living in those circumstances then.

Little people magnets on whiteboard – This was a story board of an historical event that could be moved around, for students to be interactive with.

These are great ideas to engage students when "frontloading" information.

Library Maker space

Under the leadership of the librarian, the library now also has a maker space. This is a mini technology lab where students can use the materials and tools available to experiment using and creating products from these resources. They can read or create which often results in a need for further reading and researching in order to complete or continue their creation.

Brainado

The name for this school's personalised learning pathway programme for sustainability under the UN goals. It is Librarian and teacher led.

There are categories provided from which students can choose their choice of study from. Successful engagement with this needs some elements. They choose a mentor teacher that will oversee their project and work them through the process.

Mentor teachers are the teaching staff who put their names on a list next to an area of expertise. Students choose their mentor according to what they want to do/learn.

Accountability is very important. The mentor is there to solicit community members for student and work through: Challenge, Process, Product, and help create a planning sheet with objectives to unpack.

TARRANT INSTITUTE INITIATIVE: SHELBURNE FARMS

Cultivating Pathways to Sustainability

This was an Expo day, for a variety of schools, to show their achievements around solving UN problems in their communities.

Pre-school students presented and showed us how this age group can understand the plight of real-life problems, think creatively and more importantly, action solutions.

United Nations Goal Chart

Students become global citizens, global problem solvers, working from their individual parts of the world. Showing an understanding of how everyone is part of a bigger whole.

Using UN worldwide goals, students work towards solving a problem to minimise their own or community footprint. They work in groups towards solving the problem.

They choose the problem they want to work on and under the guidance from a teacher/mentor work towards implementing a plan in real life. A very authentic/hands on learning programme.

It is supported by Vermont State and the Tarrant Institute which is funded through a grant where facilitators are paid to work alongside teachers in schools to implement and work with them on this learning journey of the students.

However, Superintendents (management level above principals) can put barriers in the way which makes it difficult for a school to move forward with this.

All these programmes give opportunity for students to apply their curriculum knowledge and further their expected achievement level to higher and deeper levels of knowledge using their own passion or interest as the carrier. This develops real life skills for ever preparing students for their future career and work expectations.

How do schools implement this programme?

Personal Interest Time (PIT) - all students work on their project for 1.5 hours per week at the same time because different students from different classes work with different teacher mentors and they all need to be able to have access to them. This aligns to their Brainado programme at Crossett Brook Intermediate school which is also part of this personal learning pathway initiative or passion project programme**.**

Assessment: Back mapping

Student voice: What are the skills you needed to complete this?

- Organisational
- Maths - design, measurement
- Communication – wider public, principal, etc
- Presenting an idea: Language, writing
- Key competencies, eg. Following up, persistence, self-management
- Costing/ Fundraising
- Health and safety rules
- Working with professionals (Real life – architects, business owners, builders, etc.)

Personal interest aligned to UN goals provides a good framework to use

Some examples: Recycling sorting table at morning tea and lunch (enviro leaders help) Repurposing clothes – tech centre (reducing waste)

Student voice gathered at the expo day: How did you benefit?

- Working as a team
- Communication (e-mails, etc)
- Teamwork – Ideas working on goals
- How to focus more
- Had to go to lots of meetings
- How to be nice to each other
- Don't give up if 1st plan didn't work
- Persistence
- Teamwork and communication
- Collaboration skills

Authentic learning elements and expectations were clearly identifiable:

- Always entrepreneurial at the end
- Personal passion equals student engagement
- Purpose for learning and develops enormous skill set as student voice shows above
- Develops real life skills – future focused
- Product always fit for public consumption - high quality which is good enough for the public stage.

CABOT SCHOOL

Peter Stratman is a passionate teacher about authentic learning experiences. He is working towards a curriculum implementation plan to reflect that. He also won a scholarship and developed an online app for teachers to use to plan collaboratively. This is not live yet. This will support the integration of subject areas and move away from teaching subject matter singularly. It could be life changing especially in high schools.

Developing Student leadership programme

Students choose areas to support the school and wider community and thereby develop real life and self-management skills. It seems to align to the UN goals as well.

These are aligned to hands on learning experiences. Jobs are provided for students to choose from each term. Students apply for more than one as they may not win their first choice.

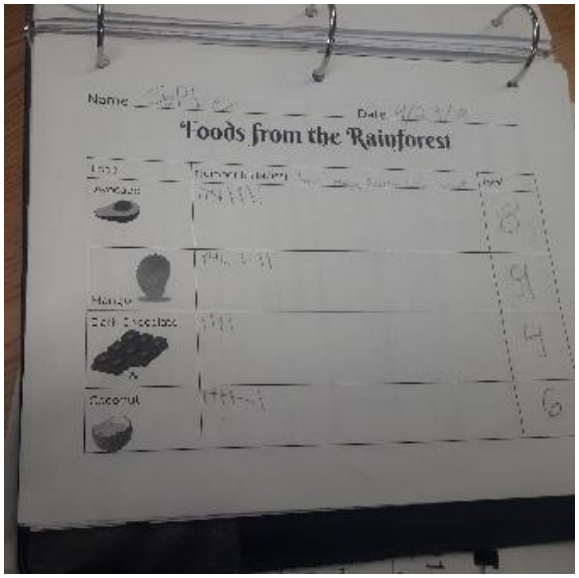
Students can apply to return to ones they like but the idea is to have participated in all categories, not just the ones they like. E.g. from helping chop vegetables in kitchen, to helping in library, or on a neighbouring farm, etc.

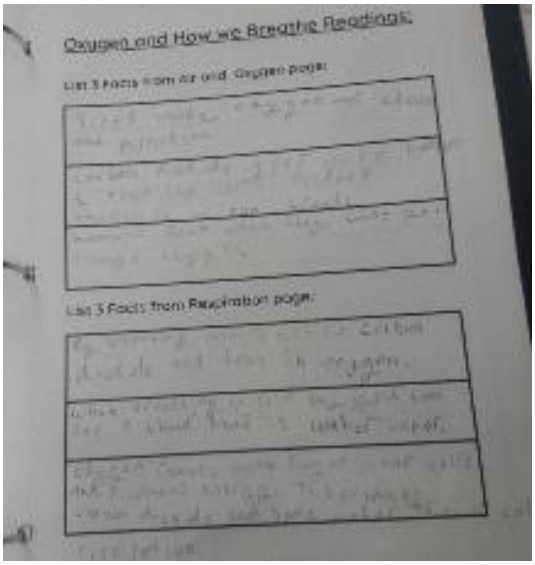
Here is a collection of photos clearly illustrating the implementation of the school's vision.

Integrated curriculum delivery - Year 3 class:

This teacher has started integrating her curriculum to broaden the perspective of her students. Great examples of using science, technology, literacy and integrated as a unit of work. The planning ap designed by Peter should help teachers like her lead the development of this pedagogy across the school.

Below are some photos to show evidence of student learning journeys with a clear progression of learning.





Peter is passionate about authentic learning and integrated his class curriculum, so students were able to design a game outside, build the enclosure for it to be played safely, and wrote the rules.

These photos show students learning in action; planning, building, playing!






They also built a pizza oven after much research on the materials' ability to hold specific levels of heat, etc. This oven and shelter are now regularly used for a variety of cooking ideas and social gatherings.



Cabot School's values and vision illustrates a clear pathway for authentic learning and with the leadership and passion of Peter Stratman, teachers have developed effective strategies to implement an integrated curriculum with real life learning at the fore.

RANDOLPH UNION HIGH SCHOOL, VERMONT

Advisor: Susan Hennessey from Tarrant Institute

We met with 3 high school teachers who had been integrating their subjects to plan and teach a more authentic learning experience for students in their classes.

They started by focusing on integrating Reading, Social Science and Writing.

Student levels showed higher outcomes in literacy. However, the Reading teacher struggled as he felt the reading material chosen was too difficult for many of his students. This is easily rectified. Reading to them should still develop vocabulary and comprehension and they are simultaneously still reading their levelled books.

Project Based Learning Programme: Junior high school years

Based on a Solution Seeking Process and aligned to a rubrics tool for assessment to get credits.

Process:

- Interpret the challenge – begin to define the problem you are solving
- Plan – determine research methodology, budget proposal, group roles and responsibilities, and community engagement plan
- Research – deepen your understanding of the challenge and its context
- Reflect and Revise – refine your interpretation of the problem ad revise your plans as needed
- Collaborate – work with your group's partners to seek a solution to the problem you have defined

- Reflect and revise – this should be on-going
- Synthesize and apply – test your solutions. Publicly demonstrate your learning. Elicit feedback from community partners

This learning does not follow a pre-determined progression of content coverage. Therefore, it will be expected that the teacher of record establish what content area Graduation Standards will be addressed and identify which Performance Indicators will be assessed whilst solving their specific problem. The rubrics for assessment will be aligned to the content and correctly levelled by the teacher.

Specific content will need to be mastered, and specific skills will need to be developed in order to solve an authentic problem in any discipline or context.

Project Based Learning Programme – Senior Project (Final year at school)

This initiative was originally designed by a passionate teacher to make English more meaningful to vocational students from around 1960. In 1989 it was re-introduced and then further developed to be integrated into their Tech projects.

The Senior Project is an important way to connect students and their community. From start to finish, local citizens are involved**.**

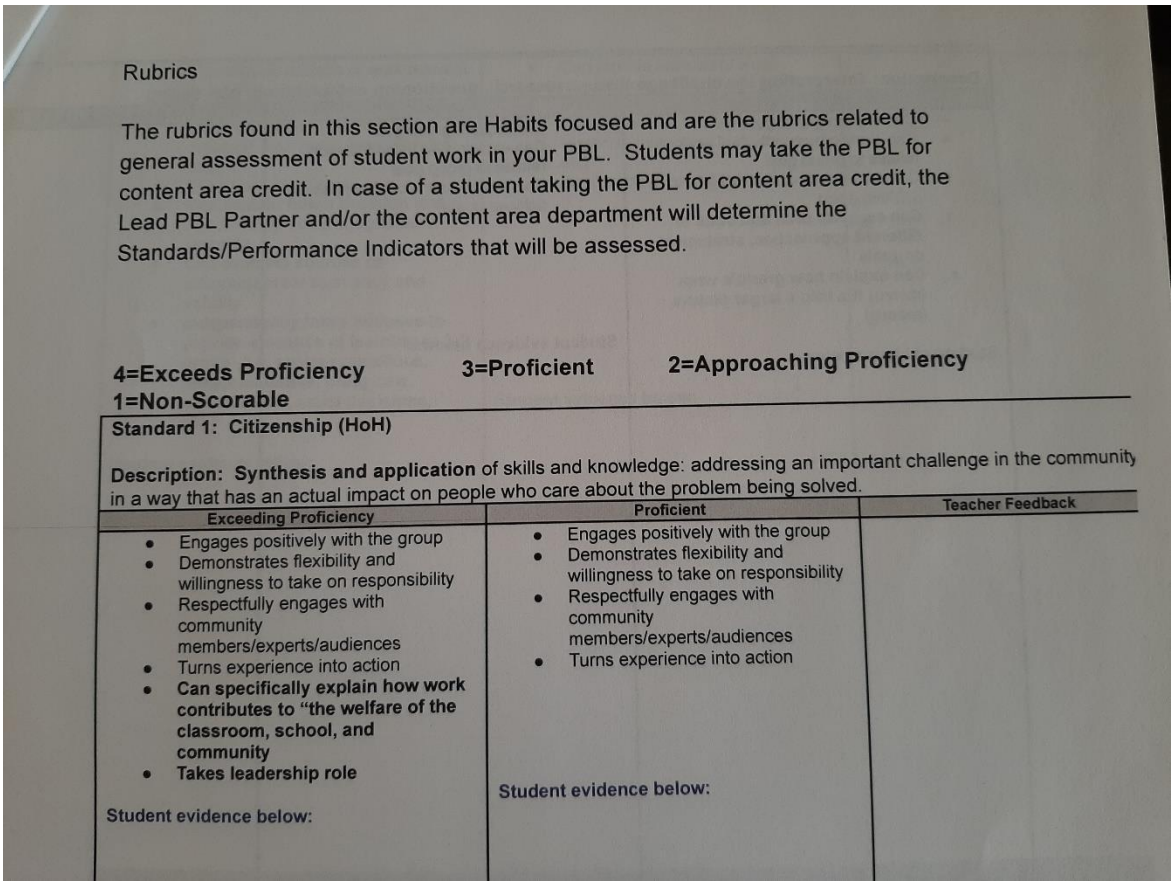
Brief: Independently synthesise and apply much of what you have gained over the years:

- Foundational Knowledge and skills in important domains (Literacy, Maths)
- Critical thinking Habits of the mind such as Evidence, Curiosity and Creativity
- Habits of Work, including Purpose and Organisation
- Habits of Heart, such as Integrity, Adaptability and citizenship

The programme consists of 6 parts: (P's and D's of Senior Project) 1. Proposal (includes all Junior High processes) 2. Paper 3. Product 4. Portfolio 5. Display 6. Defense	Product example: A set of beautifully designed and created coasters 

If students do not complete any one of the 6 components in a satisfactory manner, or fail to meet one of the publish deadlines, they and their parents will be notified that students may not be eligible to graduate in June.

There are many achievement objectives described that students have to meet. This is an example of one of the rubrics.



Rubrics

The rubrics found in this section are Habits focused and are the rubrics related to general assessment of student work in your PBL. Students may take the PBL for content area credit. In case of a student taking the PBL for content area credit, the Lead PBL Partner and/or the content area department will determine the Standards/Performance Indicators that will be assessed.

4=Exceeds Proficiency **3=Proficient** **2=Approaching Proficiency**
1=Non-Scorable

Standard 1: Citizenship (HoH)

Description: Synthesis and application of skills and knowledge: addressing an important challenge in the community in a way that has an actual impact on people who care about the problem being solved.

Exceeding Proficiency	Proficient	Teacher Feedback
• Engages positively with the group • Demonstrates flexibility and willingness to take on responsibility • Respectfully engages with community members/experts/audiences • Turns experience into action • **Can specifically explain how work contributes to "the welfare of the classroom, school, and community** • **Takes leadership role** **Student evidence below:**	• Engages positively with the group • Demonstrates flexibility and willingness to take on responsibility • Respectfully engages with community members/experts/audiences • Turns experience into action **Student evidence below:**	

Montpellier, Vermont

MAIN STREET MIDDLE SCHOOL

Green Team Leadership Academy Programme (Teacher: Don Taylor)

All students have a Personalised Learning Plan. A teacher is employed to teach this programme. He developed a pathway to achieve the required goals. Green Team Programme = 1 hour per week school time allocated

TRY - Teen Teacher Badge and Youth Climate Leader Badge

These badges are aligned to the UN goals. The work the students do to earn these are aligned to their PLP which in turn is aligned to their curriculum learning subjects.

(This provides opportunity for students to apply their curriculum knowledge to develop real life and authentic learning)

It is a highly motivating programme. Students have folders with evidence for assessments. Digital learning and folders included.

Great example of a Yr.7 + 8 (Trash audit) - Incorporated in core curriculum

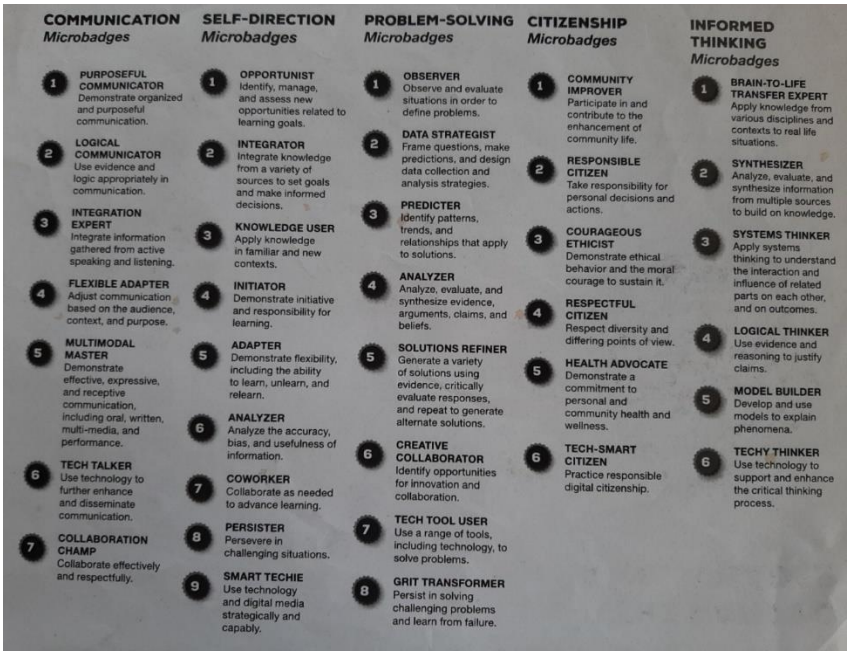
Youth Climate Leader Learning areas must show evidence in:

- Communication
- Self-direction
- Problem Solving
- Citizenship
- Informed thinking

TRY Teen Badge pathway

- Must submit evidence required for the badge
- Self-direction - Demonstrate initiative and responsibility for learning (Show evidence)
- Citizenship - Increase environmental literacy of students, teachers, parents, themselves (Show evidence)
- Communication – Demonstrate organized and purposeful communication and collaborate effectively and respectfully (Show evidence)

This is a description of the development of skills and the expectations that must be met to earn the different badges. These goals align to the United Nation goals.



COMMUNICATION *Microbadges*

1. **PURPOSEFUL COMMUNICATOR** Demonstrate organized and purposeful communication.
2. **LOGICAL COMMUNICATOR** Use evidence and logic appropriately in communication.
3. **INTEGRATION EXPERT** Integrate information gathered from active speaking and listening.
4. **FLEXIBLE ADAPTER** Adjust communication based on the audience, context, and purpose.
5. **MULTIMODAL MASTER** Demonstrate effective, expressive, and receptive communication, including oral, written, multi-media, and performance.
6. **TECH TALKER** Use technology to further enhance and disseminate communication.
7. **COLLABORATION CHAMP** Collaborate effectively and respectfully.

SELF-DIRECTION *Microbadges*

1. **OPPORTUNIST** Identify, manage, and assess new opportunities related to learning goals.
2. **INTEGRATOR** Integrate knowledge from a variety of sources to set goals and make informed decisions.
3. **KNOWLEDGE USER** Apply knowledge in familiar and new contexts.
4. **INITIATOR** Demonstrate initiative and responsibility for learning.
5. **ADAPTER** Demonstrate flexibility, including the ability to learn, unlearn, and relearn.
6. **ANALYZER** Analyze the accuracy, bias, and usefulness of information.
7. **COWORKER** Collaborate as needed to advance learning.
8. **PERSISTER** Persevere in challenging situations.
9. **SMART TECHIE** Use technology and digital media strategically and capably.

PROBLEM-SOLVING *Microbadges*

1. **OBSERVER** Observe and evaluate situations in order to define problems.
2. **DATA STRATEGIST** Frame questions, make predictions, and design data collection and analysis strategies.
3. **PREDICTER** Identify patterns, trends, and relationships that apply to solutions.
4. **ANALYZER** Analyze, evaluate, and synthesize evidence, arguments, claims, and beliefs.
5. **SOLUTIONS REFINER** Generate a variety of solutions using evidence, critically evaluate responses, and repeat to generate alternate solutions.
6. **CREATIVE COLLABORATOR** Identify opportunities for innovation and collaboration.
7. **TECH TOOL USER** Use a range of tools, including technology, to solve problems.
8. **GRIT TRANSFORMER** Persist in solving challenging problems and learn from failure.

CITIZENSHIP *Microbadges*

1. **COMMUNITY IMPROVER** Participate in and contribute to the enhancement of community life.
2. **RESPONSIBLE CITIZEN** Take responsibility for personal decisions and actions.
3. **COURAGEOUS ETHICIST** Demonstrate ethical behavior and the moral courage to sustain it.
4. **RESPECTFUL CITIZEN** Respect diversity and differing points of view.
5. **HEALTH ADVOCATE** Demonstrate a commitment to personal and community health and wellness.
6. **TECH-SMART CITIZEN** Practice responsible digital citizenship.

INFORMED THINKING *Microbadges*

1. **BRAIN-TO-LIFE TRANSFER EXPERT** Apply knowledge from various disciplines and contexts to real life situations.
2. **SYNTHESIZER** Analyze, evaluate, and synthesize information from multiple sources to build on knowledge.
3. **SYSTEMS THINKER** Apply systems thinking to understand the interaction and influence of related parts on each other, and on outcomes.
4. **LOGICAL THINKER** Use evidence and reasoning to justify claims.
5. **MODEL BUILDER** Develop and use models to explain phenomena.
6. **TECHY THINKER** Use technology to support and enhance the critical thinking process.

Finland

Education System in Finland: All pathways to learning are valued and are designed so everyone could obtain the highest academic qualification if they chose to.

It is understandable that the pragmatic, child-centred educational thinking of John Dewey has been widely accepted among Finnish educators," Pasi Sahlberg, Finnish educator and scholar, wrote for the Washington Post.

Schools are not left entirely to their own devices. The Finnish National Agency for Education promotes self-evaluation and improvement for both schools and their teachers. Finland does not use national standardized tests; however, they do implement national evaluations of learning outcomes.

Finland's evaluations are sample based, not comprehensive. They are also not tied to school funding nor used to rank schools. Instead, the evaluation looks to assess the school's qualifications and are then provided to the administrators for developmental purposes. School meals are free to all children and guidance and counselling are built in as part of the curriculum.

These photos illustrate typical resources and classrooms in Finland, including fabulous outdoor and PE equipment for students.

Finnish Education System

Level	Duration	Academic Pathway	Final academic outcome	Vocational Pathway
8			University - Doctoral or Licenciate Degrees	
7	2	Masters Degree	1 – 1.5 years: 3 yrs work exp	Masters Degree
6	3	3 Year Bachelors Degree	3.5 – 4 years:	Bachelors Degree
4		University		University of Applied Science
3	3	Matriculation examination	Work experience	Specialist vocational qualification
			Work experience	Further vocational qualification
				Vocational qualification
		General Upper Secondary Schools		**Vocational Institutions (Schools)**
		Students now choose one of the above pathways		
		Voluntary Additional Year of basic education		
1 + 2	7-16	Basic Education		
	6	Pre-Primary Education		
0	0-5	Early Education		

Education Act Change for 2020

Finland's educational act changed to support a new curriculum implementation. I did not see much of this in schools during my visit, but my understanding is that all schools must have it fully implemented in 2020. This is to cater for 21st century learning and needs to be more based outside the classroom.

The following information about implementing the new curriculum in Finland is on Kangasala School's website. School's I visited was still in the process of developing ideas of how to integrate subjects in their schools.

Kangasala pre-primary and basic education and the Finnish Core Curriculum

- Reaching for the highest treetop

The aim is to develop school culture that makes learning a meaningful experience, strengthens pupils' self-esteem and their ability to work together with others. The goal is good skills and knowledge and broad-based competence to use these skills and knowledge to guide us towards sustainable future.

It's important to keep our focus in the future. We encourage solution-oriented ways of thinking and working together to reach even higher. Together we can achieve more!

The need for the renewed Finnish national curriculum

The world around us is changing rapidly. Education needs to evolve, too, to **meet the needs of the future.** Pre-primary and basic education must help and support children to meet the challenges of the future. The new curriculum aims at ensuring that the knowledge and skills of Finnish children and youths will remain strong in the future, both in national as well as international context.

One of the key goals of the new curriculum is enhancing **pupil participation.** The pupils are encouraged to take a more active role in their own learning.

Changing world and environment

- diversity in all areas of society, environmental challenges, new technologies, globalization, changes in working life and economy
- Need for new skills and broad-based competences

New approach to learning

- need for changes in education:
- emphasis on how pupils are learning, phenomenon-based learning,
- versatile working approaches, collaboration

Changing role of the pupil

- enhancing pupil participation
- improving problem solving skills

Multidisciplinary learning modules and holistic education through cross-curricular themes

One of the aims of the new curriculum is to lower the boundaries between different subjects and take a more holistic approach to learning. Each year every school must have at least one clearly defined theme, project or course that combines the content of different subjects and deals with the selected theme from the perspective of several subjects.

These entities are called multidisciplinary learning modules. So, instead of going to the forest, for a walk, drawing pictures of forest mushrooms in art and singing about nature in music, the aim is a more holistic approach.

Similar to scientists, we would think of research questions about the forest first and then start looking for answers by means of science and art. In pre-primary education the starting point for holistic approach are the children's interests and common pre-primary learning goals.

Phenomenon based learning

Phenomenon based learning or teaching by topics is not a new pedagogical model. In fact, it is a very traditional and natural way of learning new things. The emphasis is more on learning, not on teaching.

The starting point differs from the traditional school culture divided into subjects, where the things studied are often split into relatively small, separate parts. It enhances motivation in many ways.

Phenomenon-based approach helps children collect pieces of information together to make meaningful entities. Understanding and studying the phenomenon starts from asking questions or posing problems together.

The issues to be learned are naturally anchored in real-world phenomena and skills and information learned can be applied in authentic situations. Moreover, this approach is a key to versatile utilisation of different learning environments. All in all, the most important thing is the learning process, the journey.

Assessment in basic education

The new curriculum emphasises diversity in assessment methods as well as assessment that guides and promotes learning and is based on pupils' strengths. Information on each pupil's study progress must be given to the pupil and guardians on a sufficiently frequent basis. Feedback is given in multiple ways.

So, traditional school year reports will not totally disappear. However, the emphasis is moving away from performance to learning process and from summative assessment to formative assessment. Pupils are encouraged to be creative and take risks and not be afraid of making mistakes. There is more supportive feedback, pupil-teacher conferences, and self- and peer- assessment. Pupils should learn to assess where they have made progress and where they still need to improve. Modern ICT tools, such as digital portfolios will be introduced as assessment tools in some Kangasala schools.

The role of the teacher is to guarantee that the pupils have a clear idea of learning goals right from the start of the process. Moreover, they have to make sure that the pupils receive feedback that guides and supports them throughout the learning process.

Changes in distribution of lesson hours and subject contents

The Basic Education Act specifies the subjects taught and the distribution of lesson hours. The goals and contents of the subjects have been updated to reflect today's society and the knowledge and skills needed in the future.

- Physics, chemistry, biology, geography and health education are taught as integrated part of environmental studies in grades 1-6
- Social studies begin in grade 4
- Physical activity is promoted through ergonomics, exercise
- Languages are introduced at a lower grade than before. A1, the first foreign language in introduced in grade 3 latest. B1, the second official language, Swedish, is introduced in grade 6 which is one year earlier than before. In Kangasala pupils can choose German as A2, an optional foreign language starting in grade 4.
- Crafts is not divided into technical and textile work anymore. It involves use of different techniques.
- Composing and other creative processes are an essential part of music curriculum.
- There are more optional subjects in lower grades than before.
- Education technology plays an increasingly significant role in everyday school routines. Pupils look for information, process it and present it by means of modern ICT tools and media. Programming has been integrated in the curriculum as part of the objectives set for mathematics. Pupils study coding, computing and computational thinking throughout basic education.

These changes in the education act in Finland, shows us how education globally is realising the importance of providing context and purpose to learning and that the learning journey and integration of subjects are key to support students with the ability to apply knowledge in a collaborative context and not as information separated into loose standing modules.

It also shows that countries globally are making the shift to develop the skills and the problem-solving abilities students need to enable them to operate in an ever-changing real world.

Additional Observations made if systems in Finland

Basic Education: 7 years – 16 Years

- The Municipality of each city is responsible for buildings, cleaners and salaries of teachers. Principals do not have responsibility for this.
- Teachers are paid 3 hours extra for staff meetings and parent interviews
- General teachers are employed for a minimum of 24 hours.
- Subject teachers are employed for a minimum of 20 hours.

Student hours for attending school are different

- Year 1 = Until 12 0'clock.
- Yr 3 + 4 = 24 hours per week.

Students also have many breaks during the day other than morning tea and lunch times. They have 10 minutes playtime every hour. There is a belief that this supports student engagement.

Second Language teaching

Programmes used are consistent throughout country. Specialist teachers are employed; qualified to teach the language and can speak it themselves. The programme is digital – there is a virtual app that makes it fun. It also teaches different cultures through stories and activities as part of the programme. This programme requires very little teacher planning more the ability to speak the language.

General curriculum

All curriculum areas are supported by nationally provided workbooks, apps, etc. Teachers nationally do the same. They are responsible for the implementation of the curriculum but have workbooks for follow up activities that are consistent throughout the country. There is consistency but no freedom of content or timeline of content taught.

Resources and funding

There are teachers for all classes. Classes are not small.

Play based - 3 classes - communal spaces for play – teachers share planning and oversee specific areas of play and activity.

All schools have incredible kitchen and dining room facilities with paid staff. All children eat for free. Not only those who are economically challenged.

Preschool all funded by government

Food included – Pre-schoolers are provided with breakfast when they arrive at school. They have naptime incorporated with the required mattresses, etc. funded

Student engagement is optimised by implementing authentic learning through play – developing oral language, etc. all through the planning and providing of specific play material for specific and relevant development.

Assessments

Tests are created online from a pool of questions.

Teachers choose what questions are appropriate for what has been taught. Therefore, students in Year 4 in one school may not be answering the same questions as students in another school.

TAMPERE SCHOOL

Schools in Finland range from Yr. 0 – Yr. 9 (Basic Education)

Tampere is a modern, new school based on new architectural design for schools in Finland. There are many communal areas in which students can come together for different activities, but classes are not run as modern learning environments. Teachers have their own classes and share break out spaces.

Language programmes all taught by specialist teachers using a National handbook, which includes a digital aspect for the interactive whiteboard.

Play based Curriculum for first 2 years of school. Students start in a fully play based class from age 5-6. They start Year 1 beginning of the year that they turn seven.

After school programmes are also funded by the government. There are classrooms available for these programmes. They are well organised with specific activities offered on different days.

SAKYLA SCHOOL

Music Programme: Intermediate class observation

Resourcing:

- Incredible music studios with electronic equipment and a fully funded music teacher.
- Digital equipment to compose music and play it back
- Authentic learning very real – reading music, composing music, listening to and unpacking scores of different composers, genres, etc.

Digital Technology and Authentic Learning

How can digital technology be used to effectively support real life learning opportunities?

If we look at the article below and compare it to how technology is used to simulate reality today in our classrooms the question is whether this is what we are seeing or rather games to support the regurgitating of facts.

Using Technology to Support 'Authentic' Learning

John O'Neil

October 1993 | Volume **35** | Number **8**

John Dewey, meet R2D2.

- The sagacious educational theoretician and the "thinking" computer may seem like an odd couple, but the ideas personified by these icons do intersect. Technology, some experts say, can contribute substantially to the active, experiential learning that Dewey advocated decades ago. In fact, some new and emerging technologies are rendering more permeable the four walls of the classroom, allowing students to take part in activities and projects that blur the distinction between learning in school and in the "real world."
- Dewey's theories on learning by practical experience are buttressed by cognitive research showing that students learn better when they solve real-life problems, as opposed to being drilled on decontextualized bits of information. As a result, many schools are trying to reorganize curriculum and instruction to support "authentic learning," the new catchphrase for learning by doing.
- Some of these schools are finding that various technologies can help them reach this goal, say experts. With existing computers and telecommunications equipment, for example, a student can search vast databases or collect weather data and share "online" with scientists and students at other sites. A pupil doing a research project on a planned landfill site can create a multimedia report—text, graphics, sound, and video—and present it to a community group or store it for other students to use as a resource.
- "What we're talking about here is the technology allowing the participant to change the real world—not just simulate it," says Glenn Kessler, director of the division of office and media services for the Fairfax County, Va., public schools. Instead of working on hypothetical problems, students increasingly are using technology to address some of the same issues and problems as adults. In some cases, such as when students collect data as part of a scientific research project, their work is contributing directly to advancing professional knowledge. "Students are doing *real* science, *real* economics," says Kessler.

What I have seen:

Technology provided a tool for:

- Consistency across schools for curriculum implementation (Language and online maths curriculums, national assessment question pool)

- Researching and acquiring facts to support knowledge
- Creating documents containing facts and comparisons
- Preparing and presenting findings and outcomes
- Communicating easily to businesses and institutions to obtain information needed
- Learning to use flight simulator technology
- Learning to use scientific based technology in a breeding programme (sturgeon fish)
- Learning to create code to develop robots that can move
- Learning to build or create computers in different forms (Robotics)

Assessment and Authentic Learning

Current practice

Students who find higher order abstract learning and assessments easy will also find that current assessment styles will show a positive outcome for them, but on the contrary, will also highlight, how little those who do not do well, know. A disheartening outcome, especially if some of them are knowledgeable, but not necessarily know how to show it in the way our system expects of them.

The format we use for "learning" is mostly designed in a very abstract and 1 dimensional way. It seems as if the average percentage of students that will naturally excel in this learning structure is quite low. Most will have to work hard to figure out some way to memorise and regurgitate the facts needed. (Something they possibly may not be very good at) It is thought that facts learnt like this are mostly short lived in our memory especially if there have been no deeper learning opportunities provided.

Nationalised assessment systems do not effectively allow for students who may have the knowledge to be assessed in a way they find easier to explain.

There could be a chance that students will be enabled to work and achieve at a higher level and develop skills they have not yet learnt as a result of their participation in real life learning.

Example of student voice

Steve Revington's student (Yr 4) who explained pythagoras' theory when asked by an engineer how high the egg is going to be dropped from. "Mr Revington said about 4 storeys high, but we could measure it" - and started explaining the principle. He showed an understanding of working with volume, measurement, algebra, reading for research and comprehending as a result of being driven by a need to succeed.

The question now being: In what ways can we assess student knowledge to allow for showing understanding in different ways?

Some practices observed

Rubric driven (Corbett School example)

- Back mapping working through a pre-set Rubric.
- Assessment: Backward mapping from what is expected of a curriculum level to what level was actually attained after a more integrated or real-life learning approach.
- A rubric that provides the learning journey and ends in the transfer of knowledge through a variety of ways, established by the pre-set rubric requirements. This allows for integration of subjects.
- Finland – always chose from a national pool of set questions but as per the new education act, the emphasis now is moving away from a performance based to a learning process and from summative assessment to formative assessment.

Planning with the end in mind

Backward mapping assessment strategy

A starting point for the teacher when planning the learning.

Purposeful learning: John Hattie

Learning intentions support students to understand what they are about to learn, what they need to know to achieve this knowledge.

Use of a rubric when planning and assessing:

Backward map from the curriculum expectation to what was attained. For a teacher to achieve this, a clear understanding is needed on levels above and below the expectation.

Questions to support teacher planning for assessment

- What content does your student need to know before he/she can apply their knowledge to create/solve this problem in e.g., Maths, Reading, Writing, Science, Technology, Social Science, Health.
- Create a rubric that indicates the achievement objective, success criteria and level of work for each curriculum area required.
- Add skill sets and unpack in the rubric. Clearly aligned to objectives that should be directly linked to what the curriculum expects and inclusive of our Key competencies (soft skills): Eg: Self-management, participating and contributing, Thinking
- Add stage progressions for the learning journey to align to the elements of the AMT learning approach

This rubric can be the starting point when a teacher is planning the learning journey, integrating a variety of subjects that are targeted for achieving specific skills and knowledge for assessment.

An approach worth investigating: AMT LEARNING APPROACH

- Acquisition
- Making Meaning
- Transfer of knowledge

Inquiry:

- How can we use the Transfer of Knowledge stage for assessment?
- How would teachers ensure that the authentic learning opportunity they provide is targeting the specific curriculum AO for the expected level required. The content needs to be thought through carefully, keeping the curriculum level and objectives in mind.
- What are the type of tasks teachers can design to show us how authentic learning experiences can show what students shows understanding, instead of regurgitating facts.

Examples of rubrics attached:

1. Vermont - Corbett high school
2. Vermont - Randolph High
3. Steve Revington

Conclusions

When observing the effect authentic learning has on student learning globally and the impact it may have on NZ students, I found:

In all the places and schools where authentic learning was developed, and creative teachers and principals led the way to provide these opportunities, students were highly motivated, excited and interested to develop their knowledge further to compliment/ support the outcome of their learning and goal. Whether it was learning to fly, the science needed to save a species, the literacy, maths and technology knowledge needed to make this happen, it is obvious that this is what a confident learner looks like when we actively work to develop opportunities to produce creative thinkers in a 21st century environment.

From the student voice observed, with some examples identified in the body of this report, it is clear that authentic learning education will benefit and provide students to make informed decisions when planning their future potential careers in this ever-changing paradigm they face each day.

Student knowledge after completing a real-life learning experience, has shown how knowledge can increase from the expected level in their area of learning, to levels higher than that. (Stephen Revington and Hukerenui School) This achievement comes through the opportunity to apply knowledge to something real, bringing a higher level of understanding, during the application to a real-life situation. Students who may not have understood the concepts expected during abstract learning time, may now show understanding beyond the expectation.

I saw students engaged in learning because they were inspired by real life learning opportunities.

This shows us how implementation is changing to a pedagogy focused on building skill and assessments aligned to the learning process rather than only testing knowledge.

Authentic learning aims to equip students with these essential life skills, to show the connection between learning and real-life and to give students the problem-solving abilities that they require for life beyond school.

Authentic learning experiences give students the opportunity to address the three goals of learning described in the AMT model: acquisition, making meaning and transfer (AMT). The AMT model illustrates how these three processes are interrelated

The AMT model shows us that Acquiring (A) of knowledge is as important as always, but that the next steps in the learning journey should provide real life opportunities for Making Meaning (M). The AMT model was developed by Grant Wiggins and Jay McTighe, 2011.

The importance of IT tools is shown in the Transfer of Knowledge (T) where the most effective tools should be used to explain or present the outcomes/results. (The Future Problem-Solving Model works through this process very well)

If we create a rubric to assess Authentic learning during the Transfer of Knowledge stage, we need to identify the skills students need to illustrate in order to achieve the objectives. It is important that the NZC key competencies are included as they consist of crucial real-life skills that needs to be achieved in order to be successful in life and the workplace.

To influence and support education and student achievement in NZ, we need to build capability to achieve successful student engagement and develop an urgency in students to achieve their goals; and so develop a love for learning

So, what would capability look like in our world today?

- The ability to apply their knowledge to real life experiences (Use of land, ICT, cultural responsiveness, resources close to the culture of the community, STEAM, STEM, Project Based Learning, etc.)
- Acquire the skills (soft skills) to participate and contribute to these experiences as an effective member of a team or community. (NZC Key Competencies)

To develop those capabilities, I found that effective programmes provided:

- students the opportunity to become futuristic, critical and adaptable creative thinkers, and able to utilise their skills and knowledge to create new solutions to problems;
- students with the knowledge and capability to develop those skills needed to make informed choices about their futures/careers.

Some examples of observed programmes mentioned throughout the report that shows how authentic learning supports great student engagement and learning

- Stephen Ritz: Green Bronx Machine, School C55 in the Bronx, New York success showed that authentic learning also addresses these problems: Absenteeism, cooperation and communication. In Northland, NZ, we seem to have high levels of unemployment, of early school leavers, high percentages of absenteeism, a high % Maori population, a large low-income group and the highest suicide rates in the country
- Corbett School's (Portland, Oregon) student academic performance is high and school leavers all go on to further education. Junior School students' authentic learning and inquiry themes around the Columbus river supports high levels of engagement as well as the movement away from teaching from textbooks.
- UN Goals in Vermont: This Personal Pathway learning initiative combined with the UN Goals supports high levels of student engagement and development of critical thinking skills across the state. This authentic learning initiative is creating a variety of implementation methods, all resulting in excellent student engagement and learning.
- Randolph High (Vermont): Project Based Learning Programmes, High School integrated curriculum planning and assessing
- Cabot School (Vermont) Vermont personal pathways and UN goals
- Van der Hoof School, BC., Canada - Sturgeon Project, Waterways project,
- Student voice - Steve Revington, Robotics, Corbett School,
- Finland - Music Programmes taught by highly skilled music teachers, in very well-resourced studios – giving capability for students to unpack music, create and perform their own scores.

Examples of Cultural responsive teaching and authentic learning

- Indigenous and European people of countries like America, Canada, Europe
- Belinda Daniels from Saskatoon – Teaching Introduction to teaching Indigenous Languages and Literacy.
- The success comes as a result of authentic speakers of Cree and authentic Cree knowledge keepers delivering cultural responsiveness practice.
- It is evident that a respectful approach to cultural differences is eminent to develop the relationships needed for students to thrive and achieve their learning goals.
- The NZC is a powerful document that encompasses such expectations in NZ.

Use of ICT to support authentic learning

What we're talking about here is the technology allowing the participant to change the real world—not just simulate it," says Glenn Kessler, director of the division of office and media services for the Fairfax County, Va., public schools. Instead of working on hypothetical problems, students increasingly are using technology to address some of the same issues and problems as adults. In some cases, such as when students collect data as part of a scientific research project, their work is contributing directly to advancing professional knowledge. "Students are doing real science, real economics," says Kessler.

Examples of effective practice:

- Stoney Creek School, Ontario Canada - Robotics Programme
- Student Voice: Most students who are in the club are very sure that this has led them to what they will choose as a career path. They have worked with the public sector in the design, creating parts with engineers, etc. providing authenticity and purpose as part of their learning journey.
- Van der Hoof School, BC, Canada: Flight Simulators hosted in school building.
- Van der Hoof school, BC., Canada: Integration with graphic design and IT classes to produce movies and presentations about the sturgeon breeding programme and cleaning the waterways.

Recommended Question:

When our students do research, does the research have a specific purpose set for a specific outcome? Do students use/apply this knowledge to help them solve a real-life learning challenge?

My observations of schools in the USA, Canada and Finland were that they have excellent resources to implement real life learning programmes – they have space, tools and teachers available during school hours to support and deliver such programmes. However, their curriculum does not allow for much diversion from the content expectation per year level, which makes it difficult to deliver.

NZ Curriculum

Compared to the above, the NZ Curriculum already provides us with the tools and ability to design our implementation plans to include real life learning opportunities, but we lack the human resourcing and often equipment/space needed.

- NZC objective: "To develop lifelong 21st century learners

This slide shows how authentic learning develops skills for 21st century learners which aligns very well to the NZC objective.	

NZC Curriculum states: Effective pedagogy equals:

- Creating a supportive learning environment
- Encouraging reflective thought and action
- Enhancing the relevance of new learning
- Facilitating shared learning
- Making connections to prior learning and experience
- Providing sufficient opportunities to learn
- Teaching as inquiry

P36: Key competencies

In practice, the key competencies are most often used in combination.

P 37 Learning areas

Links between learning areas should be explored. This can lead, for example, to units of work or broad programmes designed to:

- Develop student knowledge and understandings in relation to major social, political and economic shifts of the day…
- Develop student financial capability positioning them to make well informed financial decisions throughout their lives.

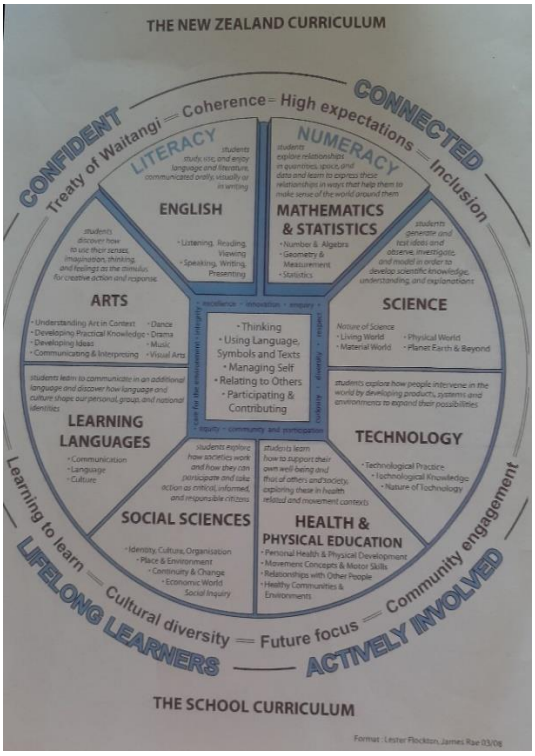
P 37 Future focus

Future focused issues are a rich source of learning opportunities. They encourage the making of connections across the learning areas, values, and key competencies and they are relevant to student's futures. Such issues include:

- Sustainability – exploring the long-term impact of social, cultural, scientific, technological, economic or political practices on society and the environment
- Citizenship – exploring what it means to be a citizen and to contribute to the development of and well-being of society
- Enterprise – exploring what it is to be innovative and entrepreneurial
- Globalisation – exploring what it means to be part of a global community and to live amongst diverse cultures

Principles of student wellbeing – an important part of the NZC:

- A culture of wellbeing;
- Ako;
- Systems



An overview of the NZC by Lester Flockton.

This shows clearly how well we can integrate our curriculum to holistically develop learners for life!

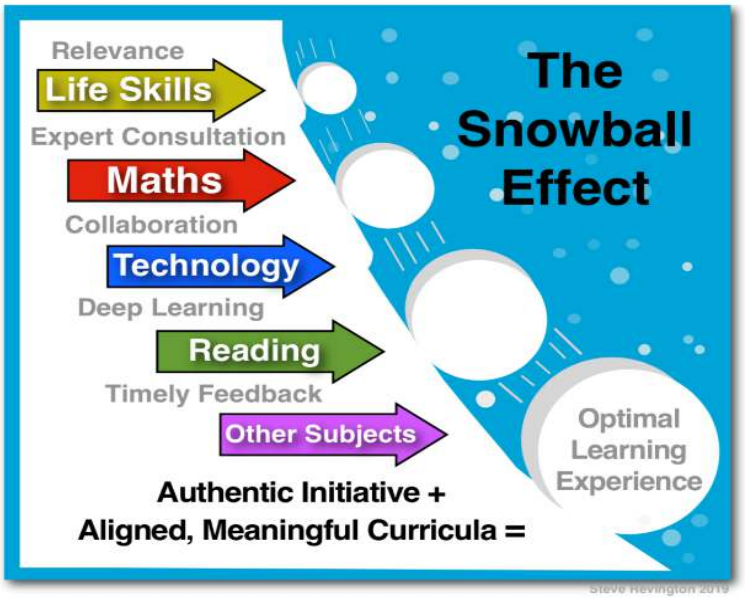
Hukerenui School implementation

At Hukerenui School, we have already developed and implement an integrated approach to incorporate authentic learning where possible. As shown above, the NZC allowed us to develop our learning to incorporate authentic learning and enhancing student engagement.

What has been developed:

- Time allocated for whole school to do real life learning together each week at the same time to encourage collaborative practice
- Integrated topic planning by teachers
- Curriculum levels aligned to planning
- Overarching topic and resources (Rural - Recognising and Understanding Rural Agricultural Learning)
- Effective use of land for real life learning: Farming maize, Alpacas, Lavender, distilling medicinal plants, Orchard, Vegetables and Compost, recycling for self-sustainability/self-management, bees, using native plants and sustaining and developing the native bush. Using produce to create products, eg. Medicinal balms using our own beeswax, alpaca fibre products, selling maize, honey and a variety of products for enterprise.

- Community involvement to support sustainability: Contractors, community businesses, experts, community helpers, parents.
- Board of Trustees - policy for sustainability accepted

This slide shows how the learning at Hukerenui School is already reflecting the snowball effect that happens as a result of integrated planning, teaching and learning, and having an authentic platform to launch their learning from. This ties in all the aspects that results into this snowball effect.	

Recommendations

Dewey said in 1915: From the standpoint of the child, the great waste in school comes from his inability to utilize the experience he gets outside while on the other hand he is unable to apply in daily life what he is learning in school. That is the isolation of the school--its isolation from life.

The outcome of any school or education system should be to send students into the world prepared for both their personal and professional lives – education and life should not be isolated from each other.

Model for Implementation

An authentic learning model has the ability to support student engagement; support students to think effectively and creatively.

The difficulty is to implement this as a whole school initiative. The positive observation is that there are many teachers who realise that to support student engagement is to create learning material that provides a purpose for learning. However, without support to develop this into a whole school model, it stays a single implementation with no further development.

Student voice provided me with the certainty that authentic learning and learning with a real-life purpose provides students with a platform that connects them to the reality of what and why we learn to do things. Such a model can:

- provide useful guidelines to support the implementation of this pedagogy that can benefit all students.
- prepare students for possible future careers by providing experiences that they succeed in, which should instil in them a passion to succeed and become learners for life.

By designing and implementing an authentic learning model:

- We can provide real life learning opportunities integrated with creative and critical thinking skills which will act as a catalyst to intrinsically develop student achievement
- It can provide students with the opportunities to learning and the acquiring of skills of all 21st century learners, practise some **real-life skills** that can continuously support them to make informed decisions about designing their yet unknown futures.
- Will help educators participate in research that suggests when teachers create meaningful learning activities that focus on the resources, strategies and contexts that students will encounter in adult life, absenteeism rates fall, cooperation and communication grow, and critical thinking skills and academic performance improve.

What were the common denominators found that supported schools successful with authentic learning?

- Connecting to the community: Sturgeon project, River theme, RURAL theme.
- A whole school theme: Teachers then level the work to fit their required level.

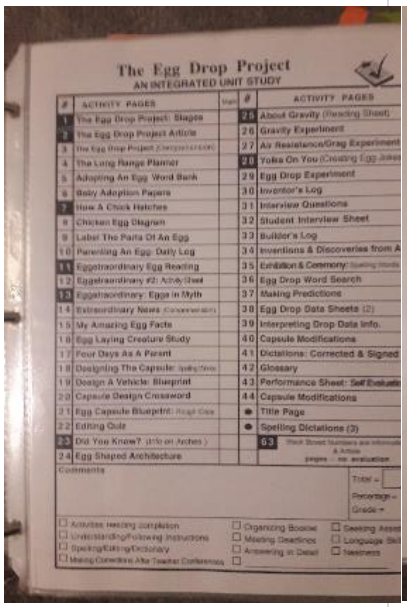
- Product: To be fit for public consumption (Steve Revington)
- Be open to opportunities: Think how anything can benefit (Flight simulator)
- Teachers to be empowered: Through buy in/ freedom to develop/ provide assessment solution/ timeslots for this to happen in school roster; to support collaboration between subjects especially in high school, e.g., maths, literacy, science.

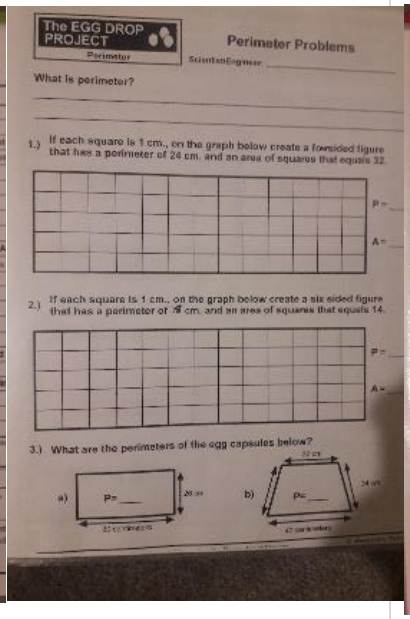
If we reflect on the examples seen in Portland, Vermont, BC, Saskatoon, Ontario and New York, there is a clear change in direction of pedagogy and specific indications of the elements needed for such a plan to succeed.

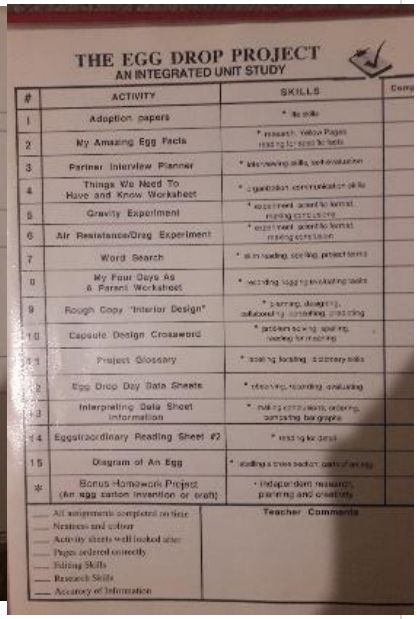
Some identified elements of successful programmes:

- A requirement for providing learning that is purposeful to the learner.
- In a variety of countries, the expectation for change is being formalised by governance which ensures this new direction is followed.
- Countries are resourcing schools effectively to support implementation. Examples from STEAM. STEM, Maker Spaces, Personalised Pathways and Phenomenon based learning (Finland);
- The expectation is for teachers to create integrated real-life learning experiences with assessment tools like a rubric for students to follow from the start.
- Rubrics have well thought through elements linked to the curriculum expectation that has to be met through the learning.
- Planning: Teachers need to purposefully plan the curriculum around these platforms to support achievement levels to align to the expectation of learning.

Below is an example of planning sheets created by Steve Revington, illustrating some of the development and learning journey of the Egg Drop Project he taught as an Authentic learning project.







- Providing time to allow for teachers to plan integrated content to curriculum levels expected and to find relevant resources to support a real life learning journey for students
- A need to integrate a variety of subjects to provide a vehicle that supports purposeful and meaningful learning.
- A variety of institutions and teachers are already working towards designing implementation plans to support this pathway.

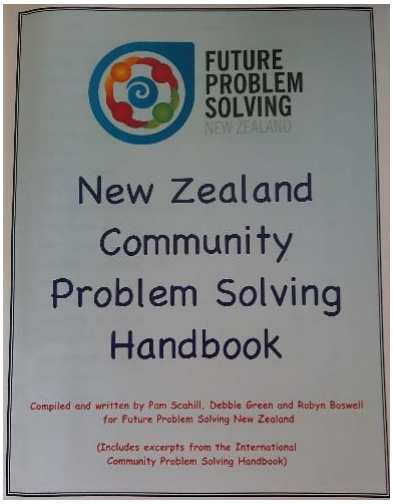
- Resourcing is very important: Enough teachers, classrooms, equipment, specialist teachers of e.g. Art, PE, special needs, etc.
- Those states provided with PLD support, were creating meaningful structures for developing real life skills in a variety of ways, e.g. Personalised learning pathways using real life learning as a vehicle to meet for instance the UN goals in their own communities. Students chose their goal and formed groups and they were led through a problem-solving journey, working through the solutions and overseen by specific teachers.
- Some schools created a sustainability class with a paid teacher, teaching each class, looking at sustainability practices.
- Another school connected with their river, another with a dying fish species, the sustainability thereof and connected to all agencies and communities around to become an integral part of the learning.
- Community involvement supports the sustainability and heart of the learning.
- The overarching topic or resource needs to be an integral point of importance to that community to ensure involvement and sustainability. Using the specific platforms/vehicles for learning that is close to the nature of that community brings uniformity/collaboration/ whole community buy in, eg:
    - Robotics
    - Sturgeon fish breeding programme - but younger classes start by cleaning up the streams – purposeful and specific reason developing towards a bigger picture and outcome.
    - Cultural responsiveness and language platforms (Saskatoon, Oregan) that provides a sense of self to students of those Native American Indian Tribes.
    - River theme - no handbooks, rather a development of learning around purposeful learning in Science, the arts, etc. student achievement at high school level
    - Green Bronx machine
    - Vermont - United Nation goals to drive personal pathway learning/development.
- Teaching Cultural responsiveness and a language needs authenticity to be truly effective. Funding is needed for teachers/facilitators/knowledge keepers to work at a school consistently. These teachers need to be qualified speakers of the language. They should be qualified to effectively present the culture and history of the nation involved. (Examples seen: Finland, Canadian Indian culture (CREE), American Indian culture (Oregon) – there are many different tribes who all operate differently.)

How does the model become integrated and not an add on:

- By planning an integrated curriculum
- By providing formal time slots
- Honour the AMT model for learning
- Use the Future Problem-Solving process to develop structure for implementation

The FPS Problem solving model works for both teacher and student buy in.
Management led to Teacher led then student led:

- A resource a school can use to develop a whole school (staff, student and community) implementation.
- It is important to develop the plan together, as it will only be consistent if everyone owns a piece of the "puzzle".
- It provides a topic that also builds a team and coherency within the school (Staff, BOT, students) and wider community
- It will support the inquiry into those elements important for implementation to succeed



Paul Torrance's Future Problem Solving model can be effectively used to develop a unique model of authentic learning at any school.

The process can be used to encourage teacher buy in and ownership. Once staff have agreed on an action plan, implementation starts with the solutions as their guideline. Teachers could identify a solution each to develop into an action plan and bring back to form the whole plan. The Community Problem Solving part of this programme makes the process authentic.

Scientists now say: Start with or provide the purpose, (whole picture) then provide the knowledge to do the inquiry.

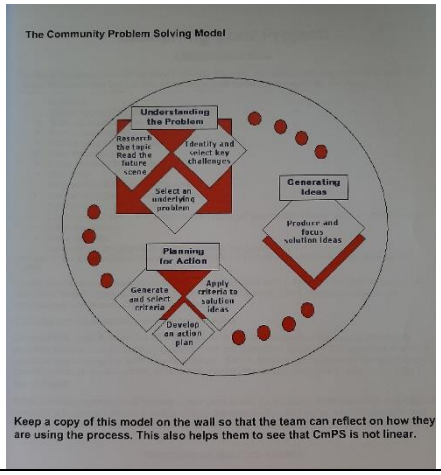
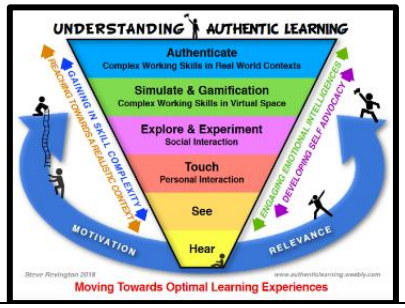
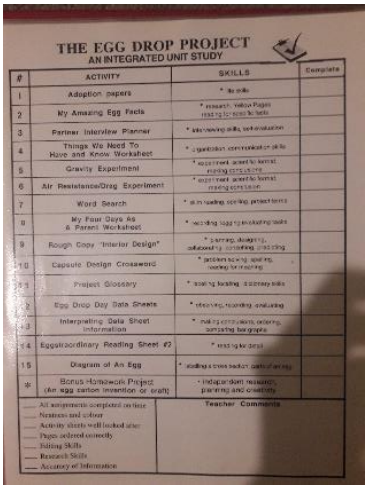
Process:

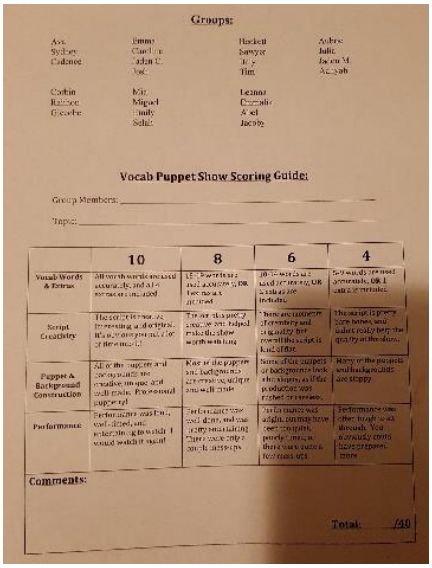
Identify your challenges that provides problems to e.g., develop an authentic learning curriculum/implement an authentic learning curriculum or align authentic learning to curriculum levels, etc.

2. Generate and Select Criteria to measure challenges against
3. Select the underlying problem
4. Produce Solution Ideas for the underlying problem only
5. Generate and Select Criteria to measure solutions against
6. Apply Criteria to measure and select 12 most effective solutions
7. Develop an action plan for each selected solution
8. Implement the plan

AUTHENTIC LEARNING MODEL

Whole school implementation	SCHOOL MANAGEMENT LED	Examples seen
Requirement for whole school implementation	• Overarching topic/resource that will support community focus (eg. Hukerenui School - Rural land providing authentic learning opportunities) • The ability to use this resource to connect to community resources, eg. University support, science research facilities and experts, business owners, • Ensure resource used is important to that community • (Examples seen: Land, ICT - robotics, River, Fish + streams, Green Bronx machine) • Creating opportunity for integrating subjects to take place • Being open to new opportunities such as flight simulator in school.	• Rural land and its possibilities • Curriculum around the river of a town • Saving an animal – sturgeon project • The arts • Green Bronx Machine – Power of a seed • Developing critical thinking through business related opportunities (Indian reserve school) • Digital technologies: • Cultural responsiveness identities and resources; eg. Marae, Native American Indian land • Sturgeon project: Science, biology, digital technology, • Literacy (creating and presenting script to university professors)
Resourcing	Teacher time needed Space needed	USA, Finland: • Enough teachers provided for specific subjects • Space and equipment provided

Whole school implementation	SCHOOL MANAGEMENT LED	Examples seen
Teacher buy in to develop whole school implementation **(Staff meetings)**	Follow Dr. Paul Torrence's CmPS model during staff meetings to develop whole school plan: • Area of concern • Challenges • Criteria • Underlying Problem • Solutions • Criteria • Action Plan • Implementation Plan	Flowchart of CmPS process from handbook 
Elements of Authentic Learning	• Acquisition (Knowledge gathering) • Making Meaning (Understanding what must be done) • Transfer (Doing it and presenting it)	Steve Revington: 
Teacher role	**All teachers: Integrated curriculum planning** • Teacher plans meaningful learning activities that provides purpose to curriculum learning. • Creates the learning challenge using the curriculum expectations to ensure students will practise the level expected and have the ability to understand better or develop further. • Rubrics for expectation and expected outcome.	Steve Revington - planning  See Corbett High School – Portland, Oregan rubric in assessments below.

Classroom Implementation	TEACHER LED	Examples seen
Integrating curriculum areas	• Choose overarching topic • Teachers plan together • Ensure level for each curriculum area involved is met • Integrate STEAM subjects (Science, Technology, Art, Maths) and add other subjects as relevant and align to the learning.	• An integrated curriculum planning template (attached) • A rubric by knowing the content and expected outcomes (assessment support)
Developing and planning for the development and achievement of 21st century skills needed for their yet unknown futures	• Managing self • Thinking • Participating and contributing • Using symbols, language and text • Relating to others	Personal Learning Programmes in schools across the state of Vermont Authentic Learning examples Culturally Responsive practices United Nations Goals used as overarching source for learning.
Assessing	• Rubric to provide a guideline for the expectation from the curriculum. • Rubric to include expectation of successful use of 21st century skills • (Soft Skills – Key competencies) • Back map/plan to establish what skills/knowledge students will need to successfully achieve the authentic learning outcome. • Create the learning challenge using the curriculum expectations to ensure students will practise the level expected and have the ability to understand better or develop further. • Know the expectations for the next level up to identify achievements above.	Examples of some rubrics (Attached)  Groups: Vocab Puppet Show Scoring Guide: Group Members: _____ Topic: _____ 10 8 6 4 Vocab Words & Extras Script Creativity Puppet & Background Construction Performance Comments: Total: /40 Corbett School Portland

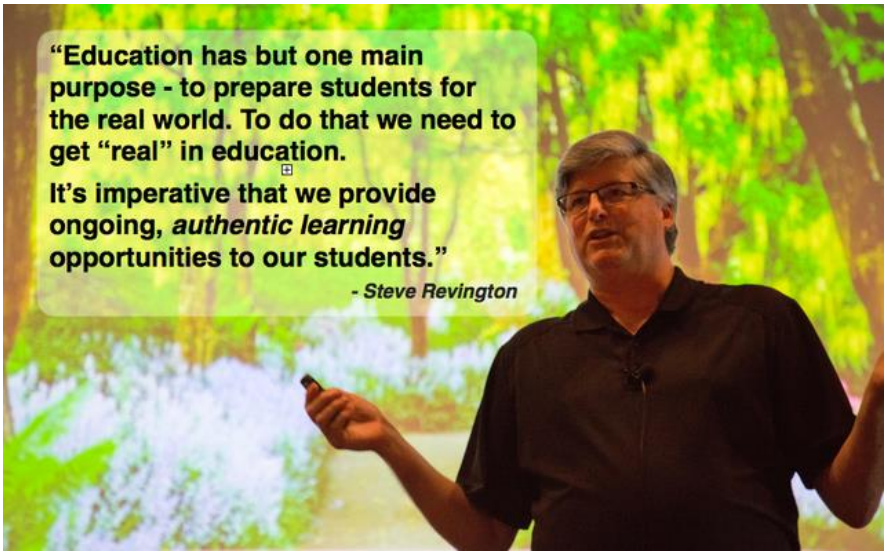
Classroom Implementation	TEACHER LED	Examples
Digital Technology supporting AL	• Research • Create • Present • Enhance reading and writing skills • Implement more effectively during transfer of knowledge stage of learning	• Search engines • Programmes like Power point, Moviemaker • Projectors • Robotics and competitions
Culturally Responsive practice	To support culturally responsive practice and teaching effectively, employ: • Authentic Language Teacher • Authentic cultural teacher • Employ cultural knowledge keeper	Digital tools and person who can speak the language to teach Kiwa Digital's CEO Steven Renata believes that long-term language preservation plans will only be implemented successfully if they have technology solutions at their heart. "Technology is opening up exciting new opportunities for Indigenous groups, with immersive technology allowing Indigenous perspectives to be communicated in unique new ways," he says. *Ko Wiriwiri rāua ko Kina* can be downloaded from the App Store or Google Play. Its production was supported by the Ministry of Education's Te Aho Ngārahu fund, an initiative aimed at improving the access to quality local curriculum resources in te reo Māori.

Many of the elements in the model above, aligns to Steve Revington's criteria as affirmed in Lawrence Muganga's thesis, Instructors' Perceptions of Authentic Learning in the Pedagogical Approaches of Postsecondary Education in Sub-Saharan Africa: A Case for Uganda

"According to Revington, AUTHENTIC LEARNING is "real life learning…that encourages students to create a tangible, useful product to be shared with their world" (paragraph 1). Revington differentiates AUTHENTIC LEARNING from other forms of student-centred learning on the basis of its involvement in the community or real Learning world. His elements of AUTHENTIC LEARNING include:

a) a tangible product;
b) a clearly defined community audience;
c) design-back planning;
d) well-defined criteria;
e) role playing;
f) integrated subjects;
g) blended scheduling;
h) collaboration;
i) personalized experience;
j) portfolios;
k) master consultation;
l) community involvement
m) (Revington, 2016).

Revington's criteria for AUTHENTIC LEARNING align with some of those articulated by Herrington (Herrington & Oliver, 2000): both scholars emphasize the importance of collaboration, diverse roles, expert consultation, facilitation, and supportive environments. However, Revington takes AUTHENTIC LEARNING outside of the classroom and into the community, which relates strongly to the principles of IAE, especially the elements of tangible product, community audience, role playing, integrated subjects, collaboration, master consultation, and community involvement."



References

According to the Partnership for 21st Century Skills (P21, 2007b),. (n.d.).

New Zealand Curriculum. (n.d.).

NZ Future Problem Solving Coach's Handbook. (2000).

Cronin, J. F. (n.d.). ome Misconceptions about Authentic Learnng. *1 G. Wiggins, (February 1991), "Standards, Not Standardization: Evoking Quality Student Work," Educational Leadership48, 5: 18–25.*

Dewey, J. (n.d.). *No Title*.

Glenn Kessler, director of the division of office and media services . (n.d.). Use of ICT to support authentic learning Glenn Kessler, director of the division of office and media services for the Fairfax C

Lisa Stamps. (n.d.). *Authentic Learning*.

O'Neil, J. (n.d.). Using Technology to Support "Authentic" Learning. *October 1993 | Volume 35 | Number 8 Issue Table of Contents*.

Pam Scahill, Debbie Green, R. B. (n.d.). *NZ COmmunity Problem Solving Handbook*.

R Bolstad & J Gilbert with S McDoweall, A Bull, S. B. & R. H. N. Z. C. for E. R. (n.d.). *Supporting future oriented learning & teaching - a New Zealandperpective" - report to the Ministry of E*

Revington, D. A. L. by S. R. (n.d.). Defining Authentic Learning.

Ritz, S. (n.d.). Greem Bronx Machine Blvd.

School, K. (n.d.). Kangasala pre-primary and basic education and the Finnish Core Curriculum Reaching for the highest treetop.

Stephen Ritz. (2017). The power of a plant.

Stratford, M. (2018). Welcome to Mendeley: Quick Start Guide.

Uganda, I. P. of A. L. in the P. A. of P. E. in S.-S. A. A. C. for, By, Muganga, L., Of, A. thesis submitted in partial fulfillment of the requirements for the degree, Philosophy, D. of, In, LEADERSHIP, E. A. A., Studies, D. of E. P., Alberta, U. of, & Lawrence, ©. (n.d.). No Title.

Attachments

1. AMT Article
2. Rubrics
3. Squidring
4. CmPS Model
5. CmPS Goals
6. Integrated curriculum plan