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Smithsonian Fellow 2015
Museum and School Partnerships: a Teacher’s Perspective

The influence of cultural partnerships on a new form of innovation inquiry within education for highly capable students in Queensland’s state schools— Putting STEAM into STEM.
Fellowship Research Question In Action

• Is technology the bridge between science and the arts?”
• Fellowship investigated this question by exploring how different Smithsonian units work with schools on STEM topics
• Critical thinking blogs and YouTube vignettes that reveal responses to that question.
Education in the Knowledge Economy

Preparing a flexible, networked & multi-skilled workforce

- Focus on connections between schools & society, the challenges of adulthood, & exposure to a wide range of contexts, role models & experiences of genuine responsibility
  (Bentley, 1998)

- Focus on innovation, creativity, critical thinking, problem solving, communication & collaboration.
  (Partnership for 21st Century Skills, 2009)
Australian Government Initiatives

*Australia in the Asian Century White Paper* acknowledges Australia’s innovation capabilities

“using creativity and design-based thinking to solve complex problems is a distinctive Australian strength that can help meet the emerging challenges of this century.”

(Commonwealth of Australia, 2012:8)
A New Landscape of Learning: The role of the Museum and Cultural sector

Working in partnership with our schools
• Understanding business climate
• Extending beyond the classroom
• Promoting active citizenship
• Developing employability
• Tackling underachievement & social exclusion
• “Participatory culture” (Jenkins, 2006) learning through networked collectives. (Thomas & Brown, 2011)
The International Baccalaureate Difference
Perceptions of Areas of Knowledge (TOK)

Art

- Individual expression – *what about working in collaboration, for commission*
- Creative and original – *and science isn’t?*
- It might be beautiful *but it also might be shocking and confronting*
- It can be made in a few minutes but *usually is the result of research and skill built up over many years*
- $ Value can be debated – *and not only the $ value- what about the intrinsic value of art to society ?*
- Art from the past still has resonance for (some of ) us – *but how is it really relevant to my life ?*

Science

- It’s about rules and laws – *yes but is it also about challenging them*
- It explains how things are rather than comments on them – *yes but there are many contested scientific debates*
- It involves lots of research and experiments – *but also the spark of a single idea or a experiment gone wrong*
- Scientific discoveries are very valuable to society – *but hasn’t lots of science advancement got the world into trouble ?*
- Now disproved science from the past has little value *but is creating knowledge always about finding a final correct answer ?*
Queensland Academies Young Scholars and Partnership Schools Program

- A teaching and learning strategy for highly capable/gifted Year 5-9 students within mainstream schools
- Education Queensland’s Framework for Gifted Education
- Extends opportunities for identified students in state middle schooling.

Context is “Pedagogy not Content” re IB and Australian Curriculum
Queensland Academies Young Scholars Program

Evolving Design Skillsets through Art and Science

Building curriculum for design thinking (design briefs, design process, and design legacy) **AND** developing discipline knowledge through reflection on action. (Schon, 1987)

Facilitation by professional designers + tertiary design academics and students

- empowers gifted students to develop new solutions **AND** embed process + visualise career pathways
- allows tertiary students to reflect on their own process development through mentoring.
Queensland Academies Young Scholars Program
QUT Second Skin – Fashion & Sun Safety Workshop
Featured on childrens’ television show Totally Wild May 2015
Queensland Academies Young Scholars Program The Cube at QUT
Reflections on Education and the Smithsonian Institution:

- Evolution of the participatory forums for learning and content creation
- Using the LRMI metadata not only as an evaluation tool but as a pedagogical resource
- Mobilization and support of communities of practice to ensure ongoing high quality teacher and student engagement and ownership.
Reflections on Education and the Smithsonian Institution:

- Roles of formal, informal, digital, face to face museum education and how these intersect
- Resources: research, experts, collections.
Reflections on Education and the Smithsonian Institution:

• open content in collaboration with museum partners as a pedagogical frame can be considered within the context of…
• “Our notions of space and what constitutes learning environments continues to evolve… It is now accepted that today’s classroom includes people, access to information, and experiences that take place outside the traditional four-walled setting where a class may happen to meet face to face.”

Reflections on Education and the Smithsonian Institution:

The use of open content also creates the opportunity for learners (school leaders, teachers, students) to create new processes and cycles of inquiry that explicitly frame sharing, critique and feedback of “knowledge” as an iterative cycle akin to design and innovation thinking.
Innovation and Design Thinking

• “The human ability and compulsion to invent - the creative act by which a new device, machine, technology, process or service emerges and to innovate, which scholars often define as the process by which inventions are rendered practical and available for one and all.” (Cultures of Innovation program, Smithsonian Museum of American History, 2005, p.1).

• This concept offers some valuable insights around learning within the International Baccalaureate environment, with its emphasis on being principled and a risk taker.
Innovation and Design Thinking

Innovation and how it links to pedagogy and a process of inquiry:

What are the pre-conditions for invention and innovation? (These may be proactive or reactive)

How do we learn to recognize the unusual and see new connections and possibilities?

What constitutes the inventive process, including problem creation/solving and navigating challenge/ recognition of failure?

Promotion/ commercialisation
Innovation and Design Thinking

Dissemination

Analysis of success and competition

Reflection upon consequences

Affecting real change in lives / communities

Valuing creativity

Embracing the potential rewards of intellectual risk-taking.

(http://invention.si.edu/explore/places-invention)
Methodology:

- Researched the diversity of educational/outreach strategies utilised by Smithsonian Institute teams

- SCLDA, SPARK!LAB, Qrious? Science How, ArtLab +, National Air and Space Museum, Explore Exoplanets, Cooper – Hewitt Design Museum, etc.
Methodology:

• Facilitating teacher/student online engagement opportunities -
• Queensland Academies Website
• Queensland Academies Youtube Chanel
• These interactive blog style activities focused on “Innovation Thinking” and drew inspiration from the Smithsonian collections in Art, Science and Design within the relevant QAPS and IB courses.

(Research Methodologies, Critical thinking and the Global Citizen and Theory of Knowledge)
Methodology:

Samples of Critical Thinking Blogs and Youtube videos:

http://qa.eq.edu.au/2015/05/the-big-picture/

https://www.youtube.com/watch?v=qC5ad3NTK7s
Methodology-Teacher as Artist:

- Are the fields of Technology and Engineering the bridge between the Arts and the Natural Sciences? (i.e. bringing STEAM into STEM)

- Through the use of *reason, emotion and imagination* identify and critically analyze two disciplines of human endeavor where this is explicit (Architecture and Photography)

- What is the role of innovation in these disciplines and why is innovation important in contemporary society?
Methodology-Teacher as Artist:

- As a visual artist- synergize a particular relationship between photography and architecture and how these two creative disciplines interact “performatively”.

- This furthered my photographic practice which embraces the notion of post-tourism and the role that contemporary photography plays in shared experiences of global consumption of tourism and travel.
Methodology-Teacher as Artist:

- Architecture - a visual outcome of the transdisciplinary field of engineering through processes of mathematics, physics, material chemistry, and construction methods.

- Public architecture, such as that of museums, plays a key role in defining a culture and embodying the historical, political, and aesthetic ideals of a community.
Methodology: Teacher as Artist

Kreeger and Dumbarton Oaks Museums (2015)
Methodology-Teacher as Artist:

- Spheres and domes: technical benchmarks, spiritual symbol of the inconsequential role of man in relation to greater powers, gods or entities
- Consideration the Smithsonian Astrophysical Observatory - hemispherical dome houses the “Great Refractor” but embraces man’s quest to observe and record the cosmos through a telescope and a photographic lens.
Methodology - Teacher as Artist:

- The establishment of the Smithsonian Institution and the invention and commercialization of photographic processes represent the intersection between formal scientific knowledge and the creative aesthetic that was both outcome and cultural driver evident in mid–late 19th century America.
Methodology - Teacher as Artist:

- Early 20\textsuperscript{th} century, photographers including James Ricalton, working in the spirit of “the grand tour”

- Stereoscopic images “experienced” through a mobile viewer that capitalized on the technology of lens development embraced the binocular disparity between the vision perceived through our left and right eyes.
Fellowship Outcomes:

• Developing understandings of the SCLDA’s strategies in building long-term partnerships between state education and cultural organisations-based not on content but rather pedagogical innovation

• Exploring differentiation strategies centred on contemporary digital pedagogy including the use of learning management systems that influence pedagogy, and create opportunities for inbuilt evaluation, web casting/ video conferencing and authentic opportunities

• The utilisation of resources and relationships with likeminded peers including museum professionals that will benefit our program delivery and that of our partners.
Future Opportunities - Outcomes for Queensland:

• Ongoing Young Scholars and QAPS online programming based on innovation **inquiry utilising the Smithsonian Digital Quests, the Learning Lab** to access and maximise the Smithsonian collection…..

• as well as **integrate resources and collections from Queensland’s cultural organisations.**
Future Opportunities: Outcomes for Queensland

- Broadening the professional network of school/museum educators committed to developing innovative educational experiences for students to include dialogue between the SCLDA and like-minded professional development organisations in Queensland.

- This would foster an interchange of knowledge/skills and build ongoing collaboration between DETE, the Smithsonian Institution and Queensland’s cultural and scientific organisations.