



Collaborative Innovation in Education - STEM, STEAM and the Economy

CONNECT Expo 2016

One student at a time
in a community of learners
small schools by design

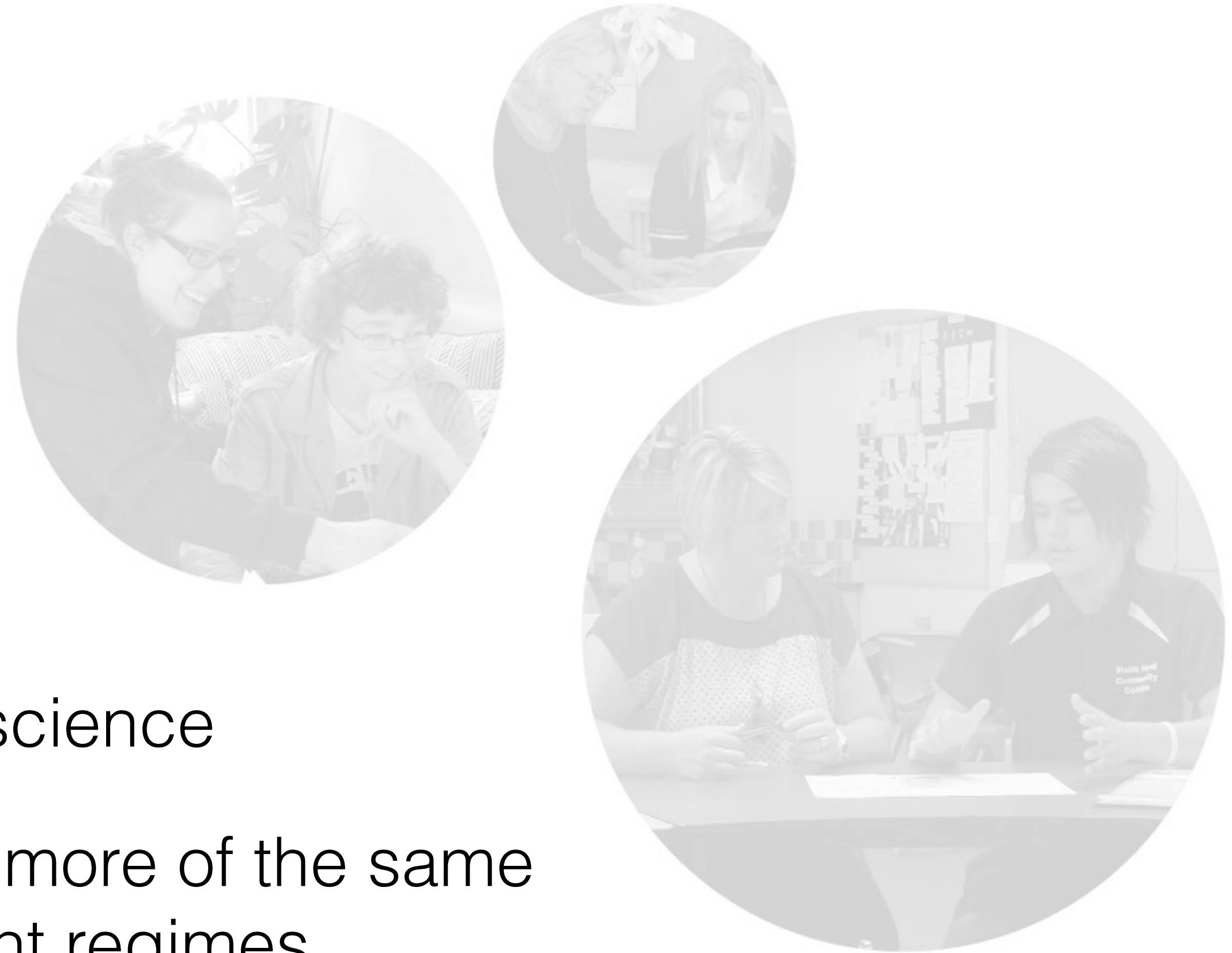
Key propositions

- More STEM for more young people
- Doing more of the same in the same way won't get the results our community needs
- succeeding in STEM is one thing but being passionate about working on society's great challenges is another.
- innovation and reform of school design is needed



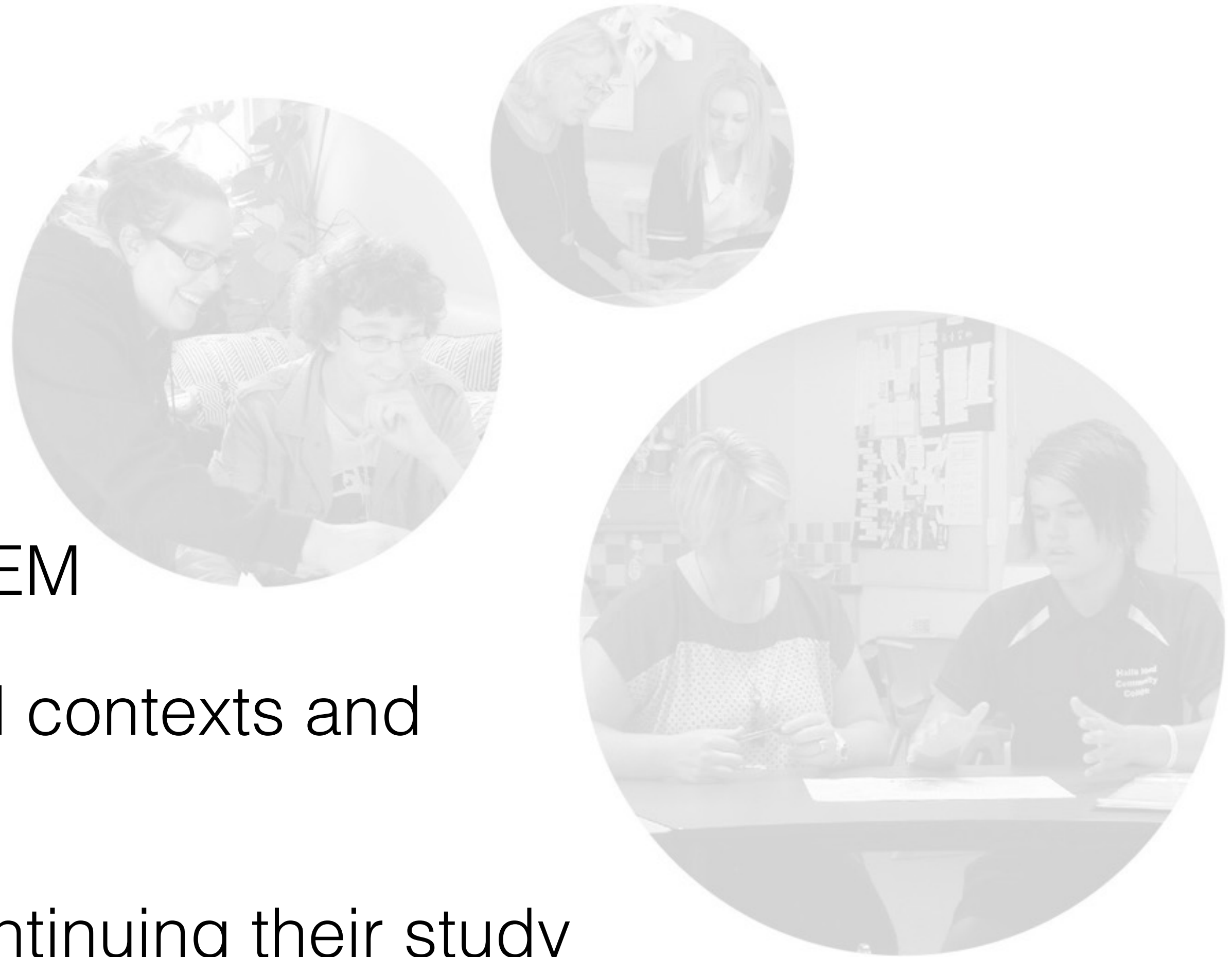
Stem issues as BP sees it.

- too many pushed out too early
- streamed too early in maths and science
- answer does not lie in mandating more of the same type of curriculum and assessment regimes



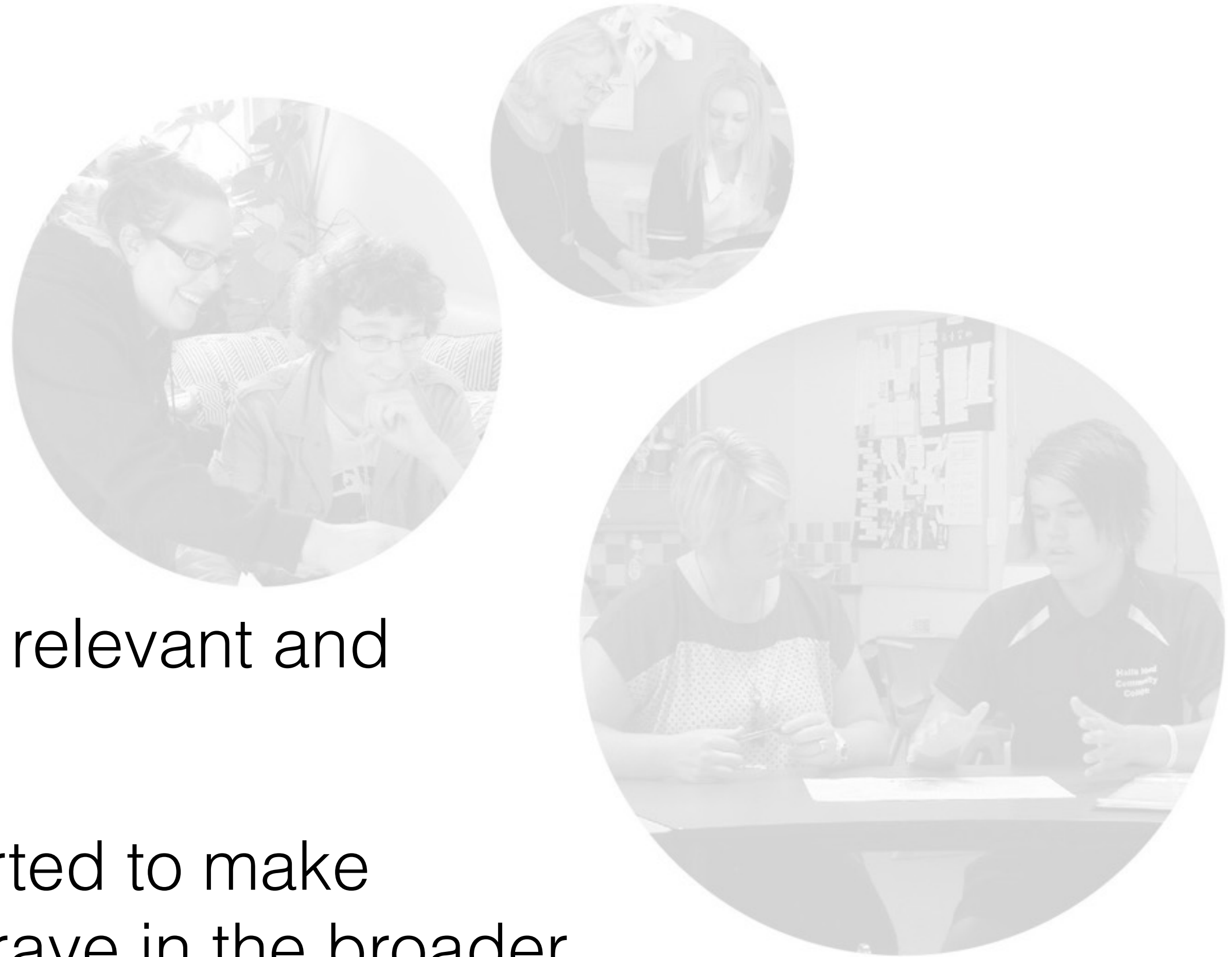
What is needed for STEM success?

- real, active engagement with STEM
- learning that is connected to real contexts and society's greatest challenges
- passionate and committed to continuing their study in STEM related areas long-term



Fundamental shift in school design required

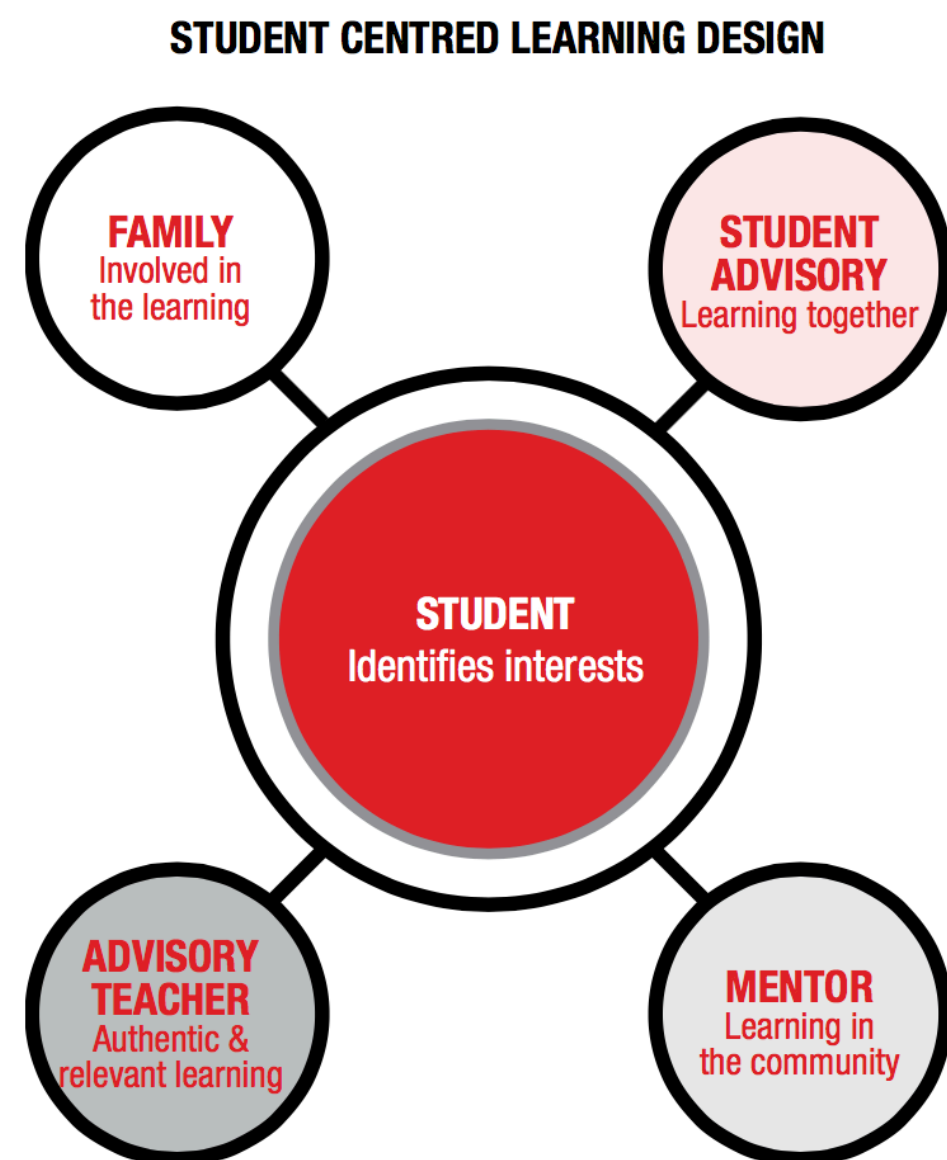
- reconceptualise school design
- the curriculum must be authentic, relevant and rigorous **Real not Fake**
- the young people must be supported to make relationships that young people crave in the broader world.



The Big Picture Design



Internships, connection and relationships



Here is what it looks like:

VIDEO:

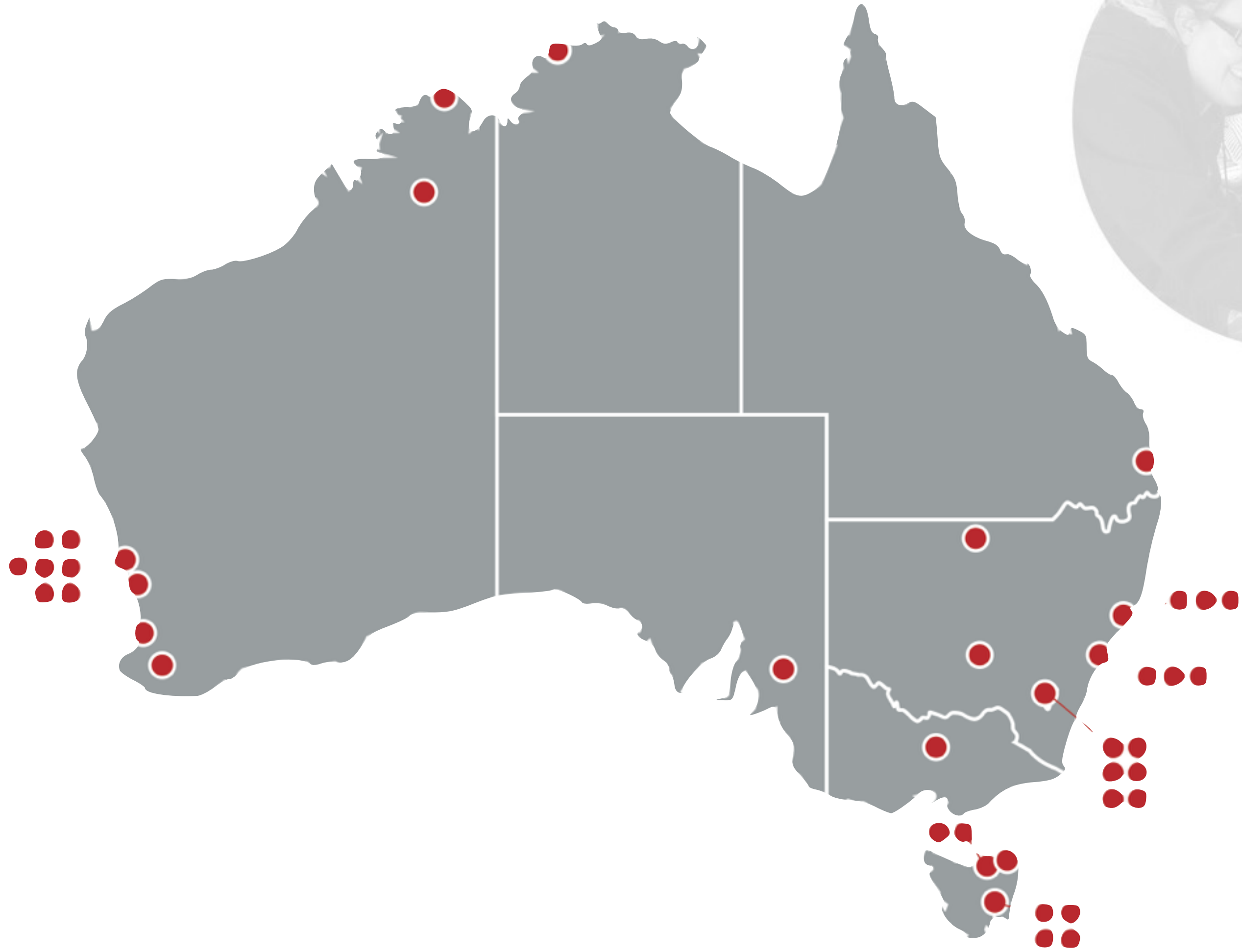
Big Picture Students and STEM



One student at a time
in a community of learners
small schools by design



SCHOOL NETWORK 2014-2015



David's story...

Mainstream Struggles:

School was difficult due to:

- shyness
- lack of access to teachers
- fear of asking for help in class

My First Steps:

- I learnt about the Big Picture design for learning
- I liked the idea of open goals



David's story...

The Big Step:

My first exhibition was on Butchery
I was SO nervous...

First Consultations with a Neurosurgeon

January 2013

- bodyboarding incident - 'the scorpion'
- pole vaulting training - back problems
- result - broken L4 and a slipped disc



David's story...

Then to Now:

My aspirations to be a butcher had gone.
I became interested in science topics, and
felt a good connection to biology

I did projects on:

- Mycology, Scoliosis/Spondylolisthesis, Bacteriology, Natural Selection, Biomechanics in Athletes

I really enjoy **Microbiology**.



David's story...

Next Level:

In Big Picture I have accelerated my learning:

- Stage 6 Biology in Yr 10 → enrolling in 'High Performing Students' program at University of Newcastle.
- Currently studying 'Foundations of Health & Disease' there.

I am part of a Pilot Team around Australia applying for **portfolio entrance to university.**

I am setting a pathway for the future.

David's story...

Today's Goals:

Current and upcoming projects:

- Infectious diseases of the central nervous system (CNS)
- Medications and the CNS

➔ Study medicine and become a neurologist.

➔ Become one of 2 in my family to go to university.



One student at a time
in a community of learners
small schools by design

How do we get there (overview)

What an innovative school design and pedagogy might look like and why it should be at the heart of STEM related school change:

- Expanding STEM to STEAM
- Using the Big Picture Education design: interest-focused learning, internships, relationships and connection to community.....
- Real-world connection, students' interest in compelling challenges of our time



One student at a time
in a community of learners
small schools by design

Miki is 18. He has a passion for digital art and design and visual display technology. Miki has invented a display that emulates holographic technology and has the potential to revolutionise the entertainment, media and marketing industries. He has developed a small-scale prototype and has been able to adapt the design to potentially scale up a holographic image to 8 metres. However, Miki wants to retain intellectual copyright over his invention so he is looking for industry and entrepreneurial partnerships and to sign a non-disclosure agreement.



Interest-focused learning

Sajeet is a Nepalese immigrant now living in Australia. He has a passion for engineering, specifically bridges, because in his village he could see the positive impact a bridge would have for his community. At a Big Picture school, he was able to pursue this passion by interning at an engineering firm. His mentor supervised Sajeet as he took responsibility for planning and leading a special project for lighting a compound. Sajeet is now studying engineering at university.

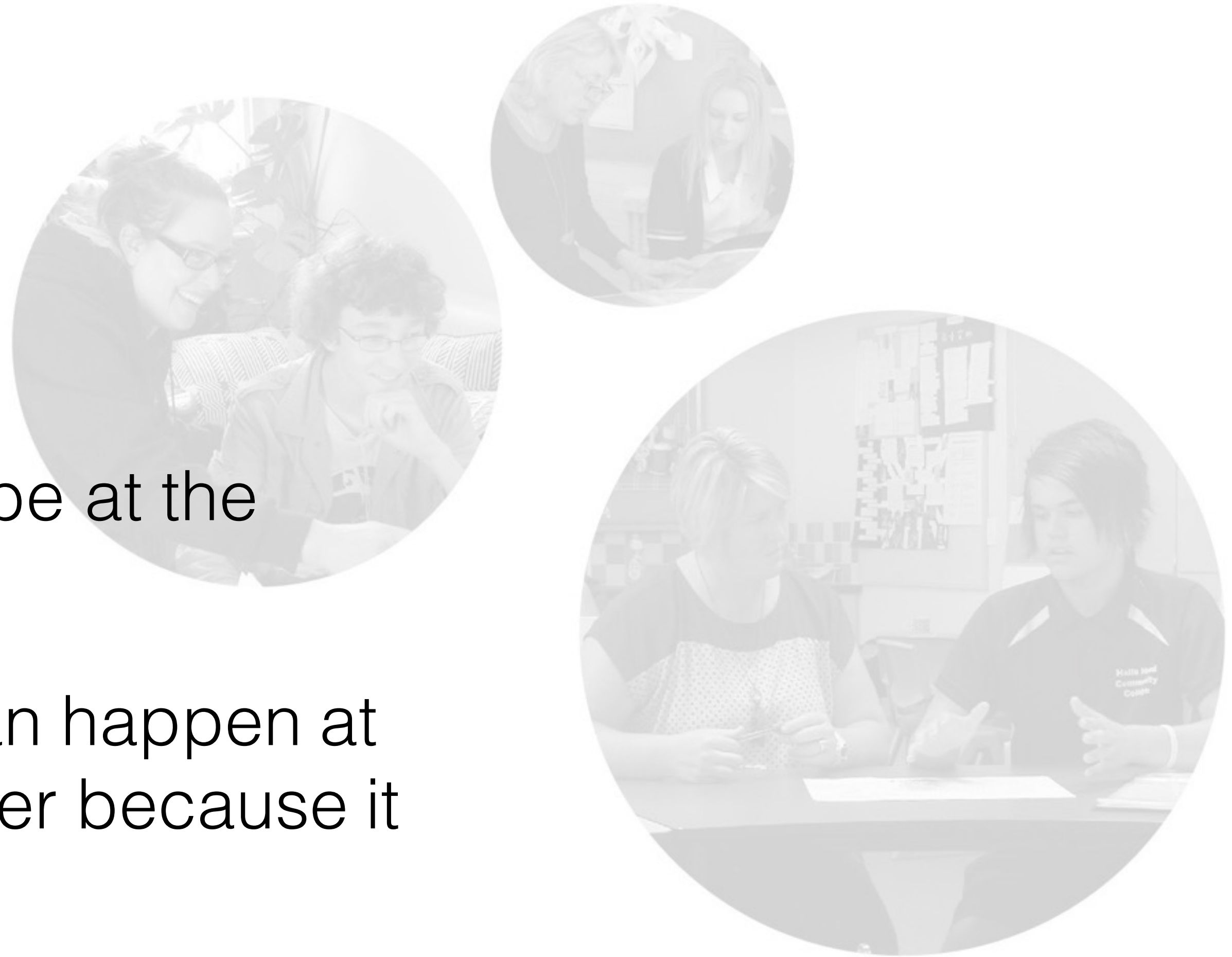
The Value of the STEAM Approach to the Community and the Economy



Active citizenship. Real-world connection,
students' interest in compelling challenges of
our time

Tying it all together

- Why implementing this design should be at the heart of STEAM innovation.
- Results in real engagement – which can happen at any time, should be able to happen later because it will be better, deeper engagement



Moving towards Collaborative Innovation in Education

Where to from here? Advocacy, Big
Picture programs?



A relevant and real-world curriculum

Simon had an internship with the Wilderness Society with his mentor Rebecca. He planned a project related to documenting the endangered species in a significant Wilderness Region in Tasmania. Simon documented some 69 endangered animals. Before he had even finished his internship over 60 people had successfully accessed and used it.

