



University of
South Australia

Teaching for Tomorrow- Applying authentic contexts in STEM teacher education



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Industry Placements for pre-service teachers





Project Aims

The overall aim of the project is to provide an opportunity to prepare and support Design and Technology, Science and Mathematics PSTs to become STEM education leaders and to give PSTs the skills and experience to develop sustainable school-industry partnerships during their studies at university and into their teaching careers.



- Phase 1 What is STEM Education?

- <https://www.youtube.com/watch?v=hBMtvtbt2gU&feature=youtu.be>
- Defining STEM is complex
- Definitions and interpretations of STEM are diverse



Phase 2 Industry placements

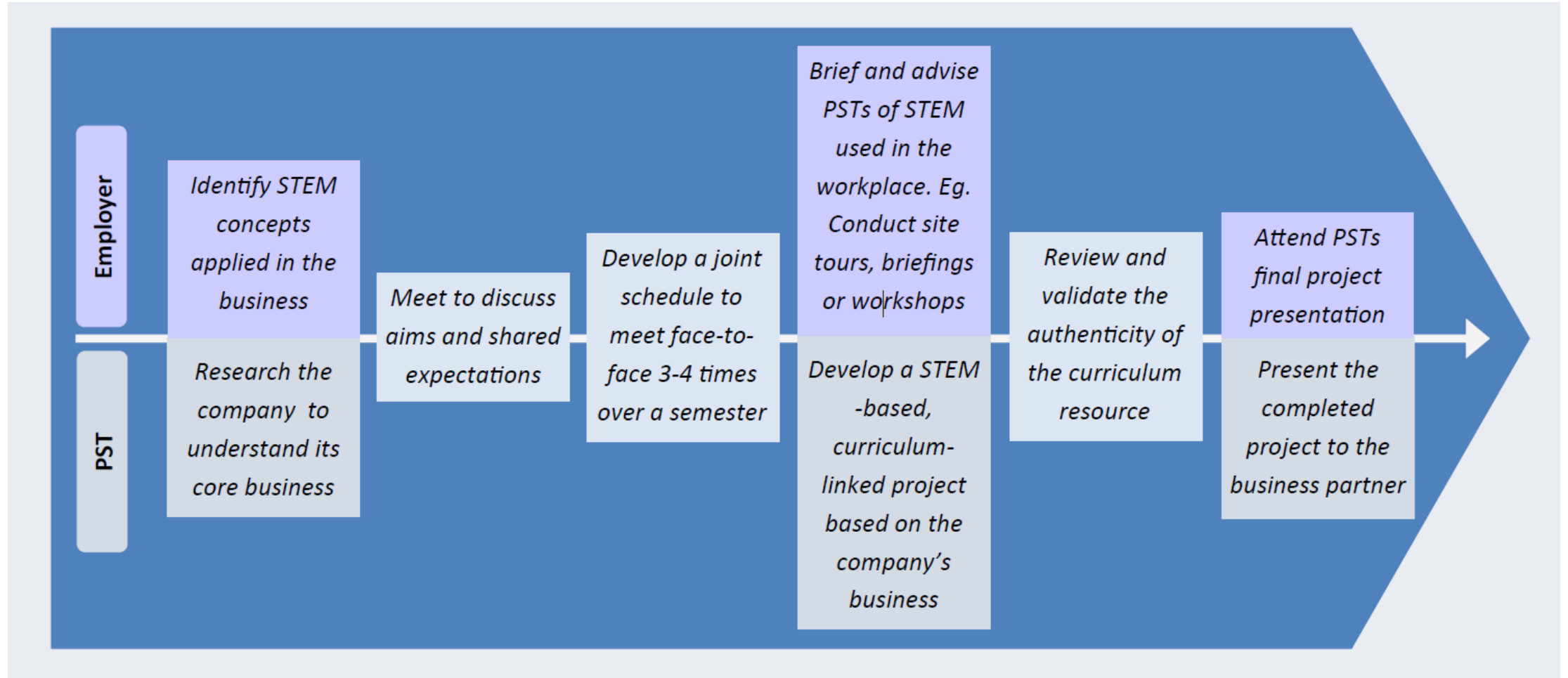
- 20 secondary Design and Technology PSTs were placed in one of six industries. Each of the industries had been identified by the South Australian Department of State Development, based on the diversity of the manufacturing processes they offered.
- The participating industries were associated with aviation, fashion, food production and textile manufacturing.





In parallel with the industry visits and during on-campus Design and Technology classes, PSTs developed their awareness of STEM through discussions, readings and videos of past graduates who were now teaching STEM courses in secondary schools. Several lectures from industry-based quest speakers were also arranged to help better prepare the PSTs for their visits.

Engagement process



Design based Project

- PSTs worked collaboratively with their industry partner to identify and develop a design-based project that would engage and inform school students, teachers and/or members of the wider community of an aspect of the industry's manufacturing processes.
- The aim of the project was to provide a specific purpose for engagement at the industry site; that is, the project provided a context or focus for observations, dialogue and interaction with both industry personal and fellow group members.
- Each project necessitated research into the history and ethos of the host industry, identifying links to STEM education, and investigating the processes involved in manufacturing the product.



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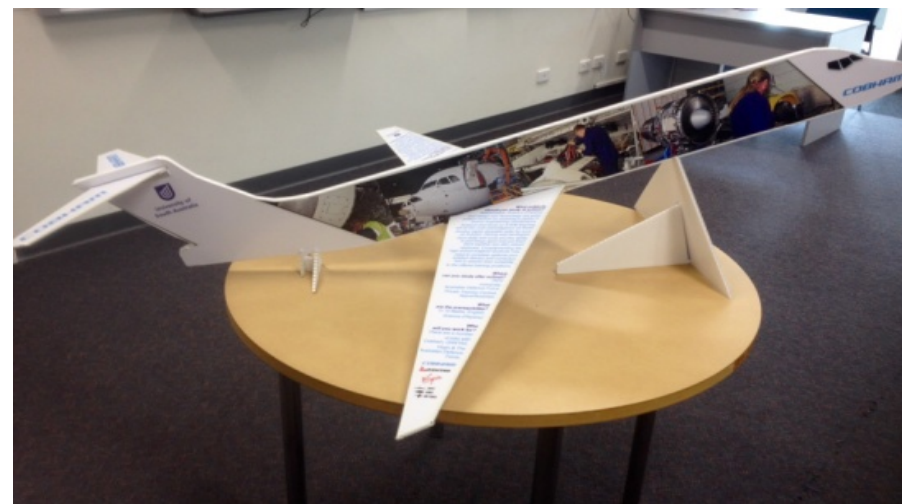
Projects



Australian Fashion Labels



Udder Delights



Cobham Aviation



Data Collection

- A pre industry visit [questionnaire](#), to ascertain the PSTs previous experience of industry, issued in Week 1 of the course to each student.
- A [focus group discussion](#) in industry groups, which visually documented discussion through a graphic organiser. The graphic organiser captured the challenges and benefits of the industry placement.
- A final individual [journal entry](#) reflecting on the industry partnership learning outcomes, submitted after the final presentation to industries.



Findings

- *'Being in an industry setting will enable me to gain first-hand knowledge and understanding about the industry, how it operates, and who it employs. Having this knowledge will help me better prepare students for their future'.*
- *'It was good to see how the whole process of garment production comes together, from sourcing materials from around the world, to looking at new fashion trends, and designing garments ... it will be easier to teach this process if you know the processes behind it.'*
- *'I now have a connection to an industry that I previously knew nothing about, this connection will help me to develop teaching resources, like the cheese making video, and this experience will inform my teaching'.*



Findings

- PSTs stated that they had a clearer understanding of the connections between Science, Mathematics and Technology. Additional outcomes included developing collaborative and team working skills and increased self-confidence.
- *‘I had to overcome anxieties as I contacted the industry to organise our visits. I think I will be more confident when contacting school principals and school staff now’.*



Challenges

- Choice of industries was limited and in some instances meant PSTs travelled large distances to undertake site visits. A number of PSTs wanted the opportunity to identify their own industry sites.
- Constant communication between all parties is instrumental to the success of the project.
- While the design-based project provided a strong focus for PSTs' observations, questioning and discussions, it was also a distraction.



Challenges

- The initial point of contact was often not the person that the PSTs actually met and worked with. In a number of cases, the purpose of the project was reiterated several times in order to provide clarity. The most successful partnerships were those where one person within the industry managed the project from initial contact through to the final presentation.
- Not all industries were able to provide the same level of commitment to the project.



Challenges

- There were no tried and tested scaffolds to support the PSTs and no comparative initiatives to shape the expectations of the PSTs and industry partners.
- Projects involving industry partnerships need to be structured and well-organised but flexible enough to deal with the complexity and demands of each industry.



What did we learn?

- Positive outcomes of industry placements for PSTs, included: an increased awareness of industrial processes and links to STEM; improved connection between the industry and the school curriculum, particularly planning for student learning; the development of interpersonal skills such as communication, teamwork and organisation as well as increased self-confidence and exposure to external professions.



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Thankyou

- Questions???