ReMSTEP

RECONCEPTUALISING
MATHEMATICS
AND SCIENCE
TEACHER EDUCATION PROGRAMS

SESSION THREE: PST LEARNING WITH SCIENTISTS

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SESSION THREE: PST LEARNING WITH SCIENTISTS

Prof Vaughan Prain, La Trobe University

PRE-SERVICE TEACHERS LEARNING WITH SCIENTISTS

1. What is the value to participants, including pre-service teachers, scientists, teacher educators, teachers and students, of interactions/partnerships between pre-service teachers and scientists?
2. What diversity of productive interactions are possible?
3. What are enablers and constraints in these interactions?
4. How can these interactions support PSTs' understanding of contemporary science practices?
5. How can these interactions enable school science curriculum renewal and innovative practices?
6. What are future directions in these interactions?
7. What are the opportunities for up-scaling these interactions and their effects?

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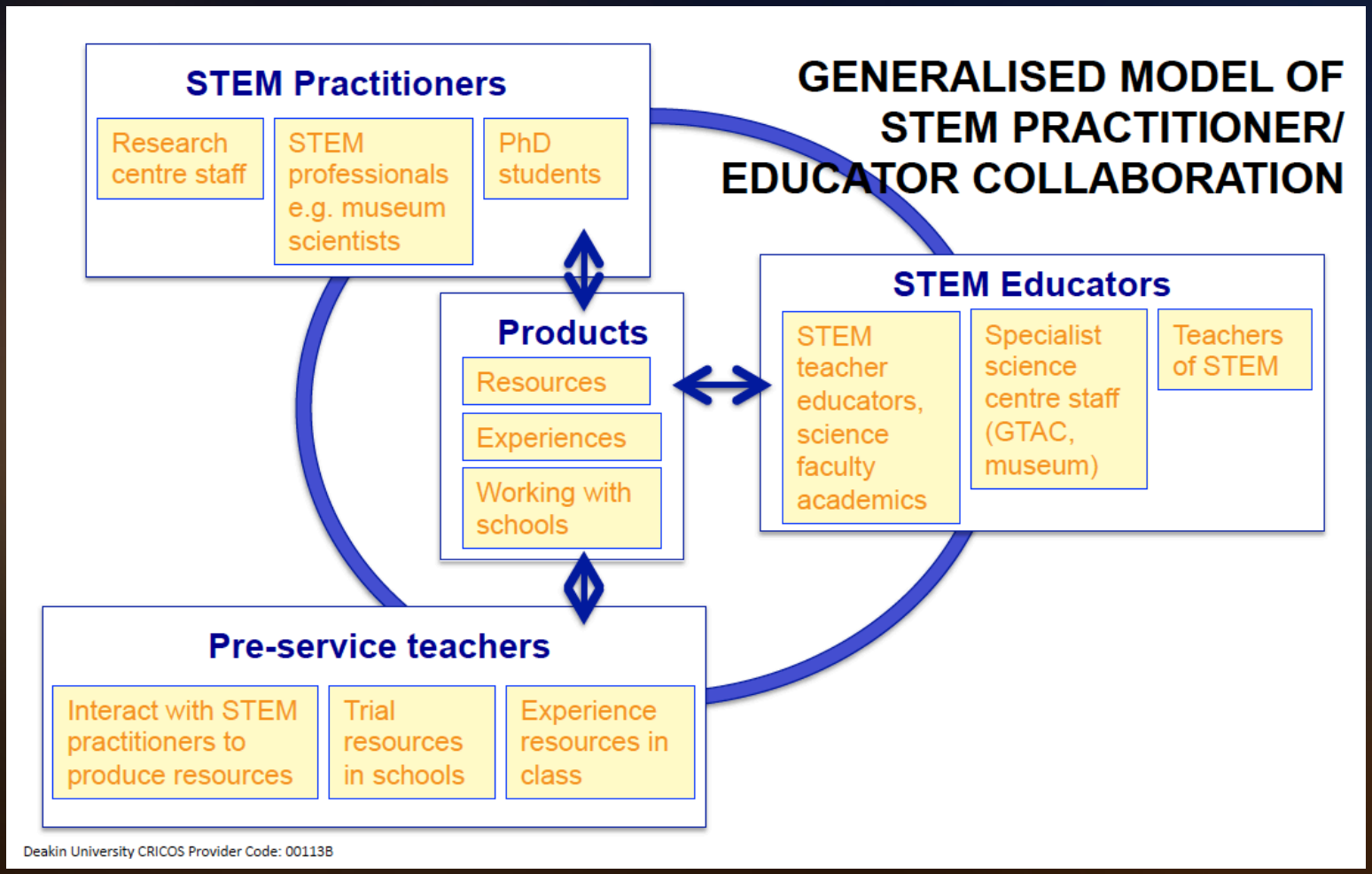

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MULTIDISCIPLINARY SCIENCE AND TECHNOLOGY IN EDUCATION

Jana Mollison

MSTIE AT BENDIGO DISCOVERY CENTRE

https://youtu.be/uf6zlsjKvd0

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SCIENTISTS AS PARTNERS IN EDUCATION

Jennifer Ling

GRIME SCENE DETECTIVES

https://youtu.be/nRZjw0QuZc8

REMSTEP - GRIME DETECTIVES

1. ReMSTEP - Plan and Production

2. Primary Setting

3. Student Engagement

4. Quality communication to teachers and schools

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GROWING TALL POPPIES WITH REMSTEP

Dr David Hoxley, La Trobe University

GROWING TALL POPPIES tackles

Teacher quality/capacity

Content

Stereotypes

Lack of perceived need for educational or career pursuits

Parent & Career Councillor advice

Not required as prerequisite

Lack of interest as little humanistic connection – interest

Lack of own perceived ability (too hard)

Perceived as highly mathematical and requiring high maths ability

Seen as compromising or not optimising ATAR

Research: Murphy & Whiteleg; Pino & Couso; Daly et al., 2006, 2007, 2009

To connect with physics girls need

1. **Self efficacy** –social cognitive theory (how do girls come to decide that they can succeed in physics) [The self-efficacy literature links student science self-efficacy to persistence in science study and career choices in science]
2. Self concept – **Physics Identity** - able to identify with physics gives a sense of belonging)
3. **Social constructivist** theory suggests 2 aspects which are important for girls to connect with physics

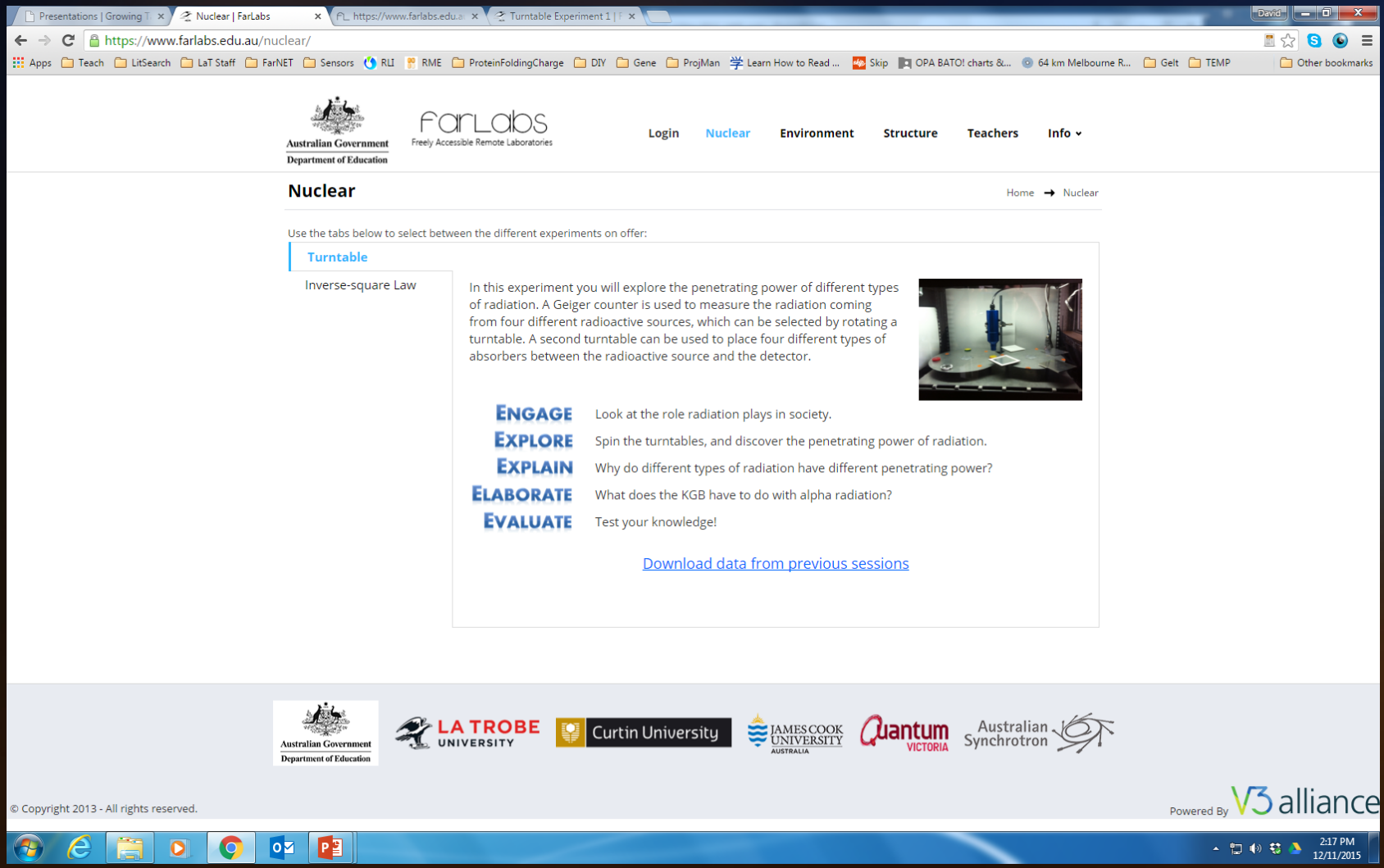
a. **Social context of content learning** – perceived relevance or authenticity of what they learn – girls need social relatedness

b. **Social context of the subject** i.e. the people associated with it [girls placed a high value on references to society and social involvement when learning physics]

TALL POPPIES AND REMSTEP

- PSTs in Growing Tall Poppies SPIEs (Scientists as Partners in Education)
- MTeach Practicum/PRP linkup
- Rachel, Mun-Xing

FARLABS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Turntable Experiment 1 | F
David
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Apps
Teach
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LaT Staff
FarNET
Sensors
RLI
RME
ProteinFoldingCharge
DIY
Gene
ProjMan
Learn How to Read ...
Skip
OPA BATO! charts &...
64 km Melbourne R...
Gelt
TEMP
Other bookmarks
Australian Government
Department of Education
farLabs
Freely Accessible Remote Laboratories
Login
Nuclear
Environment
Structure
Teachers
Info
Nuclear
Home
Nuclear
Use the tabs below to select between the different experiments on offer:
Turntable
Inverse-square Law
In this experiment you will explore the penetrating power of different types of radiation. A Geiger counter is used to measure the radiation coming from four different radioactive sources, which can be selected by rotating a turntable. A second turntable can be used to place four different types of absorbers between the radioactive source and the detector.
ENGAGE
Look at the role radiation plays in society.
EXPLORE
Spin the turntables, and discover the penetrating power of radiation.
EXPLAIN
Why do different types of radiation have different penetrating power?
ELABORATE
What does the KGB have to do with alpha radiation?
EVALUATE
Test your knowledge!
Download data from previous sessions
Australian Government
Department of Education
LA TROBE UNIVERSITY
Curtin University
JAMES COOK UNIVERSITY AUSTRALIA
Quantum VICTORIA
Australian Synchrotron
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SCIENCE AS A HUMAN ENDEAVOR: THE INSTITUTE FOR FRONTIER MATERIALS

Assoc Prof Stuart Palmer, Deakin University

Research in Deakin University's Institute of Frontier Materials

This initiative aims to develop teacher education materials based around Year 7-10 modules that introduce students to the work of engineers and scientists at the IFM. The package will include school activities and challenge activities for pre-service teachers

Dr Mandy De Souza, Research Fellow
How did the main question behind your research come about?

https://youtu.be/PCGKsE6Jk1E

Mr Matt Jennings, PhD Candidate
Do you rely on the assistance/contributions of other staff in your work?

https://youtu.be/_5yD-9dXUSo

Dr Maryam Naebe, Research Fellow
How is your research work funded?

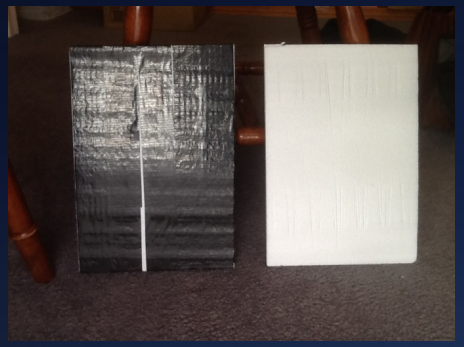
https://youtu.be/qX8sshXRmec

Dr Ben Allardyce, Postdoctoral Research Fellow
How did you get to be a researcher at Deakin University?

https://youtu.be/udwiw5Qdd70

“Lightweight strands of carbon fibre have very high strength when stretched in tension, but crumple if pushed from the sides or ends. These fibres can be set (‘cured’) into a hard plastic resin and the resultant carbon fibre composite material is lightweight and combines the tensile strength of the fibres with the rigid structure of the resin matrix when it sets solid. Carbon fibre composites are light and strong, but the raw materials used are expensive and a lot of energy is required for their production, and the curing process to produce a carbon fibre product takes a long time compared to the manufacture of similar products made from metals.

Carbon fibre composites are used in applications where weight is more critical than cost, such as aircraft. Scientific research continues to find cheaper and more sustainable raw materials from which to make carbon fibres, and engineering efforts are directed at minimising the energy needed to produce the fibres and the time required to curing of products made from carbon fibre composites.”



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PSTS DEVELOPING CONTEMPORARY BIOLOGY MULTI-MEDIA RESOURCES

Peta White

PANEL DISCUSSION

- David Hoxley
- Gail Chittleborough
- Stuart Palmer
- Jen Ling
- Russell Tytler
- Rachel Beagley

SESSION 2 SLIDE 12

- What are key insights?
- Personal experience of being a scientist
- Understanding professional practices of scientists
- Exploring new topics & areas of research in science
- Adding value to the professional practice
- Formal learning outcomes

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WRAPUP: WHAT ARE THE KEY INSIGHTS?

Prof Vaughan Prain, La Trobe University

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