Pedagogy On Demand: A Virtual Classroom to Support STEM Education

Lead: Australian Catholic University
Partners: Griffith University and Queensland University of Technology

PURPOSE
To create an innovative resource and pedagogy for teacher educators that supports pre-service teachers in designing inspirational teaching and learning experiences in STEM (Chubb, 2012).

GOALS
The creation of a collection of resources that:
- interests and engages 21st century pupils;
- addresses the mandated curriculum;
- capitalises on technology;
- highlights the role of “teachers as designers”;
- uses a freely accessible e-learning management system, Schoology, for professional dialogue about teaching and learning (i.e., podchats); and
- provides access to resource pods and archived podchats beyond formal use in a teacher education program.

IMPACT
This project creates a third space bridging university coursework and professional practice. By incorporating multimedia vignettes of diverse teaching practices, it provides the opportunity for rich and productive discussions connecting theory and practice.

OUTPUTS
Product – Resource Pods
- Mathematics in Sports: Years 7 to 10
- Science in Sports: Years 7 to 10
- Mathematics in Cryptography: Years 7 to 10
- Science in Cryptography: Years 7 to 10
- Science of Space Tourism: Years 7 to 10

Papers


THEORETICAL FRAMEWORK
Interest and Engagement
- Engagement Theory (Schunk)
- Situational Interest (Alexander)

Context
- Situated Cognition (Greene)
- Content-based Learning (Gilbert)

Cognition
- Episodic Memory (Tulving)
- Multimedia Learning (Mayer)
- Social Learning (Lewin & Wong)

Teachers as Designers (Tao, Ho, & Hofberg)
- Selective and creative in web-based resource use
- Tailor learning experiences to individual 21st century pupils

ACKNOWLEDGEMENTS
Our thanks to: participating schools, teachers and pupils; participating pre-service teacher education students and staff at ACU, QUT and GU; and personnel at the Australian Academy of Science and ACU. We acknowledge copyright permission from resource owners of web-based materials included in the resource pods.

Support for this project has been provided by the Australian Government Department of Education and Training.