ReMSTEP

RECONCEPTUALISING
MATHEMATICS
AND SCIENCE
TEACHER EDUCATION PROGRAMS

CONFERENCE NOV 2015 – SESSION 2

SCIENCE SPECIALISATIONS WITHIN PRIMARY PRE-SERVICE PROGRAMS

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SESSION OUTLINE

10:30 - 10:45am	Overview: Science and Mathematics Specialisations at the University of Melbourne
10:45 - 10:50am	Science Specialists Strand at Deakin University
10:50 - 11:00am	Primary Science and Mathematics Elective: collaboration with Gene Technology Access Centre (GTAC)
11:00 - 11:05am	Video showcasing the pre-service teacher experience of the Primary Science and Mathematics Elective
11:05 - 11:10am	Introduction to the collaborative forum with the pre-service teachers
11:10 - 11:30am	Forum with the pre-service teachers
11:30 - 11:40am	Feedback from the forum is sought and uploaded to a central repository
11:40 - 11:55am	Panel discussion and Q&A
11:55 - 12:00pm	Close

7 INNOVATIONS

1. Contemporary science and mathematics in integrated science and pre-service units of study.
2. Undergraduate science students engaging with schools.
3. Science specialisations within primary pre-service programs.
4. Specialist Science and Technology Centre collaborations.
5. Practicum opportunities in world-class research environments.
6. Building on existing student expertise in science and mathematics.
7. Building a recruitment pipeline of high potential mathematics and science teachers.

MASTER OF TEACHING (PRIMARY) PROGRAM

The Master of Teaching (Primary) is a two year, full-time post-graduate program that qualifies Teacher Candidates to teach across all primary years as a generalist teacher.

Semester 1, 50 points
Up to 15 contact hours per week, plus 2 days per week school placement and 1 block placement of 10 days.

Semester 2, 50 points
Up to 15 contact hours per week plus 2 days per week school placement and 1 block placement of 15 days.

Semester 3, 50 points
Up to 15 contact hours per week, plus 2 days per week school placement and 1 block placement of 15 days.

Semester 4, 50 points
Up to 15 contact hours per week, plus 2 days per week school placement and 1 block placement of 15 days.

Master of Teaching (Primary) ready to teach

NATIONAL PROGRAM STANDARDS

- **Graduate entry primary programs** must comprise at least two years of full-time equivalent professional studies in education.
- These programs must include at least one year of full-time equivalent study **(100 points)** of discipline-specific curriculum and pedagogical studies across the learning areas of the primary school curriculum.
- Programs must include at least **one-quarter of a year** of full-time equivalent study **(25 points)** of discipline-specific curriculum and pedagogical studies in each of **English/literacy** and **mathematics/ numeracy**, and at least **one-eighth of a year** of full-time equivalent study **(12.5 points)** of discipline-specific curriculum and pedagogical studies in **science.**
- These programs may include up to one-quarter of a year of full-time equivalent study **(25 points)** of **relevant discipline studies** as **elective units** which could be undertaken by applicants who do not fully meet prerequisite discipline study requirements

2016 PROGRAM OVERVIEW

200 points completed over four semesters (2 years full-time)

1	S1	Professional Practice & Seminar 1 (6.25)	Learners, Teachers & Pedagogy (12.5)	ICT in Primary Education (6.25)	Foundational English Literacy (12.5)	Primary Mathematics Education 1 (12.5)	
	S2	Professional Practice & Seminar 2 (12.5)	Assessment for Teaching (6.25)	Primary Humanities Education (6.25)	Primary Arts Education (12.5)	Advanced English Literacies (6.25)	Primary Mathematics Education 2 (6.25)
2	S3	Professional Practice & Seminar 3 (12.5)	Social & Professional Contexts (6.25)	Researching Education Practice (12.5)	Science & Technology Education (12.5)		Health & Physical Education (6.25)
	S4	Professional Practice & Seminar 4 (6.25)	Education Research Project (Primary) (12.5)	Designing Personalised Learning (6.25)	Literacy, Assessment & Learning (6.25)	Primary Mathematics Education 3 (6.25)	Elective subject (12.5)

Course Handbook: MC-TEACHPR Master of Teaching (Primary)
https://handbook.unimelb.edu.au/view/current/MC-TEACHPR

MATHS SPECIALISATION 2016

1	S1	Professional Practice & Seminar 1 (6.25)	Learners, Teachers & Pedagogy (12.5)	ICT in Primary Education (6.25)	Foundational English Literacy (12.5)	Primary Mathematics Education 1 (12.5)	
	S2	Professional Practice & Seminar 2 (12.5)	Assessment, for Teaching (6.25)	Primary Humanities Education (6.25)	Primary Arts Education (12.5)	Advanced English Literacies (6.25)	Primary Mathematics Education 2 *Extension (6.25)
2	S3	Professional Practice & Seminar 3 (12.5)	Social & Professional Contexts (6.25)	Researching Education Practice (12.5) *Lit Review and Project Proposal Maths Focus	Science & Technology Education (12.5)		Health & Physical Education (6.25)
	S4	Professional Practice & Seminar 4 (6.25)	Education Research Project (Primary) (12.5) *Maths Capstone	*Designing Personalised Learning (6.25)	Literacy, Assessment & Learning (6.25)	Primary Mathematics Education 3 *Extension (6.25)	Elective subject (12.5) *Maths Elective

Primary Mathematics Education 1	12.5
Primary Mathematics Education 2 Extension	6.25
Primary Mathematics Education 3 Extension	6.25
Prof Prac/Clinical Assessment	3.75
Researching Education Practice	12.5
Education Capstone Project	12.5
Maths Elective	12.5

TOTAL: 66.25 Credit Points

SCIENCE SPECIALISATION 2016

1	S1	Professional Practice & Seminar 1 (6.25)	Learners, Teachers & Pedagogy (12.5)	ICT in Primary Education (6.25)	Foundational English Literacy (12.5)	Primary Mathematics Education 1 (12.5)	
	S2	Professional Practice & Seminar 2 (12.5)	Assessment For Teaching (6.25)	Primary Humanities Education (6.25)	Primary Arts Education (12.5)	Advanced English Literacies (6.25)	Primary Mathematics Education 2 (6.25)
2	S3	*Professional Practice & Seminar 3 (12.5) *Clinical Assessment 30%	Social & Professional Contexts (6.25)	*Researching Education Practice 12.5 *Lit Review and Project Proposal with Science Focus	*Science & Technology in Practice (12.5) *Only available for science specialisation		Health & Physical Education (6.25)
	S4	Professional Practice & Seminar 4 (6.25)	Education Research Project (Primary) (12.5) *Science Capstone	*Designing Personalised Learning (6.25) *Science Project	Literacy, Assessment & Learning (6.25)	Primary Mathematics Education 3 (6.25)	Elective subject (12.5) *Science Elective

Science & Technology in Practice	12.5
Science Elective	12.5
Designing Personalised Learning	6.25
Prof Prac/Clinical Assessment	3.75
Researching Education Practice	12.5
Education Capstone Project	12.5

TOTAL: 59.0 Credit Points

ELECTIVE SUBJECTS 2016

Subject code	Subject	Credit points
EDUC90425	Australian Indigenous Education	12.5
EDUC90428	Promoting Student Wellbeing	12.5
EDUC90727	Teaching Global Perspectives	12.5
EDUC90493	Arts & Artistry: Studio to Classroom	12.5
EDUC90543	LOTE in the Primary Classroom	12.5
EDUC90793	Positive Pedagogy: Science of Teaching	12.5
EDUC90711	Foundations of Physical Education	12.5
EDUC90722	Education, Practice and Place	12.5
EDUC90794	Science in the Integrated Curriculum	12.5
EDUC90861	Leading Mathematics in Primary Schools	12.5
EDUC90504	Leadership in schools	12.5

*2015 Elective

EDUC90376	Science and Mathematics in the classroom	12.5

EXPRESSIONS OF INTEREST

Introduced at Open days and Orientation

Information session at the beginning of semester

Expressions of Interest:

- Selection Criteria
  - Previous undergraduate/post graduate studies in maths/science
  - Previous employment in the field/s
  - Other experience/justification
  - Results in Semester 1 maths subject (H2A average)

PRIOR STUDY: WHAT IS THEIR BACKGROUND?

Undergraduate/ Honours Course Categories	Candidate Numbers	Science Specialisation	Maths Specialisation
SCIENCE	14	12	2
ENVIRONMENTAL SCIENCE	1	1	0
AGRICULTURE	1	1	0
HEALTH SCIENCE	4	3	1
PHARMACEUTICAL SCIENCE	1	1	0
ARTS/ PSYCHOLOGY	3	1	2
ARTS	3	1	2
PSYCHOLOGY	6	3	3
BIOMEDICINE	1	1	0
BUSINESS	4	0	4
PHYSIOTHERAPY	1	0	1
ENGINEERING	2	0	2
DESIGN/ ARCHITECTURE/ MULTIMEDIA	2	0	2
COMMERCE/ ACCOUNTING/ FINANCE	5	1	4
	48	25	23

PREVIOUS EMPLOYMENT: WHAT IS THEIR BACKGROUND?

EMPLOYMENT EXPERIENCE	NUMBERS
LABORATORY	2
HEALTH/ PHARMACY	3
TUTOR	8
TEACHER	4
TEACHER AID	1
UNIVERSITY LECTURER/ DEMONSTRATOR	2
FINANCE/ ACCOUNTANT	3
BUSINESS ANALYST	3
CORPORATE	2
ENGINEER	3
ARCHITECT/ DESIGN	1
IT/ SOFTWARE	1
CARTOGRAPHY	1
VOLUNTEER WORK IN RELATED INDUSTRY	1
RESEARCH	2
OTHER	6

EXPRESSIONS OF INTEREST #EXAMPLE

I have had various roles throughout my career which have provided experience in science and technology. These are broadly grouped as **Teaching Experience**, **Scientific Research and Professional Experience.**

TEACHING EXPERIENCE:

- **Laboratory class demonstrator** (teaching 2nd & 3rd year) in the **Zoology Department** at The University of Melbourne
- **Acting head demonstrator** for **undergraduate Biology**
- **Biology tutor** at **University College**
- **Volunteer Centre Guide** at the **Marine Studies Centres** in Queenscliff and Tooradin.

POST DOC EXPERIENCE: (1996-2001)

- **Completed PhD in 1996** at the **Department of Zoology** UniMelb.
- **Research Officer** in the **Department of Physiology** at UniMelb.
- **Supervisor** of graduate and undergraduate students.
- **Co-researcher** on project funded by **National Heart Foundation** and NH & MRC Grants.
- My area of interest was **cardiac electrophysiology.**

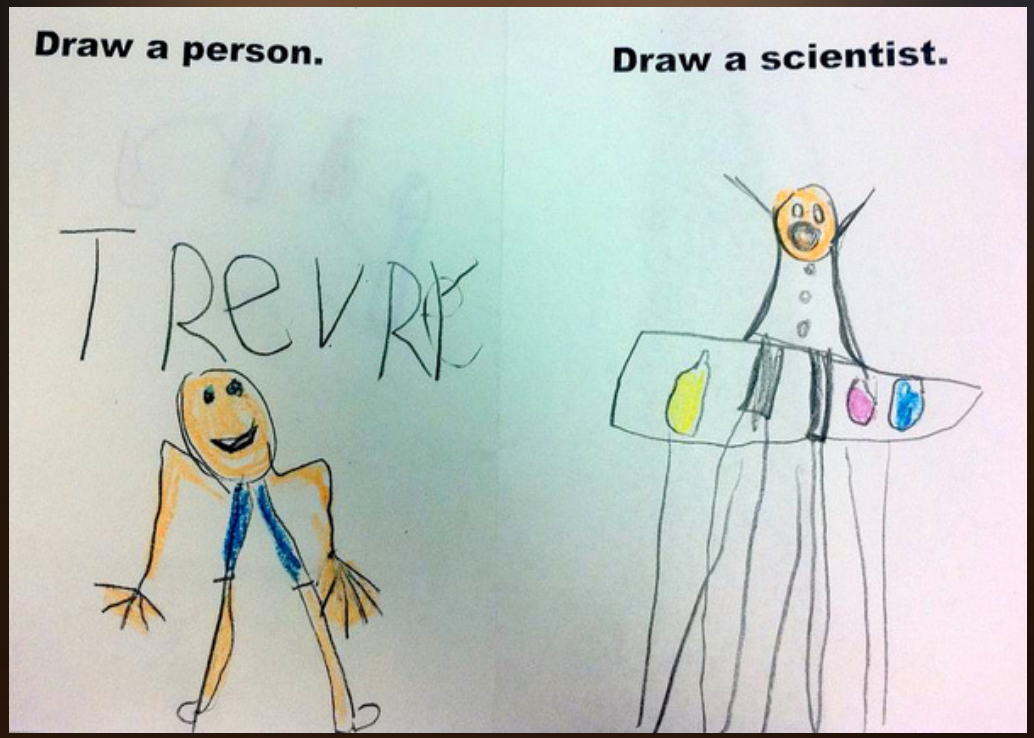
PROFESSIONAL EXPERIENCE: (2001-2014)

- **Completed Graduate Diploma** in **Business computing in 2000** from **Victoria University of Technology**
- **Business Analyst and System Architect**
- **Developer of computer system designs** and **IT requirements**.

SCIENCE & MATHEMATICS ELECTIVE

EDUC90376 Science and Mathematics in the Classroom

The subject focuses on supporting the effective integration of Science, Technology, Engineering and Mathematics (STEM) into the Primary Classroom environments.



STEM
Science • Technology • Engineering • Math

SCIENCE & MATHEMATICS ELECTIVE

- Work collaboratively with a team of **academics**; education officers from specialist science centres, scientists, mathematicians, school-based staff and teachers;
- Together, plan, prepare and rehearse model lessons for the teaching of the *Adaptations* topic, embedding Mathematics and drawing on Technology;
- Implement rehearsed lessons in PLTs over six weeks in our partner schools; and
- Modify and refine in response to student needs to produce units of work for sharing on ReMSTEP site.

GRADUATE SCIENCE SPECIALISTS

Let’s hear about the experience from the Teacher Candidates …

PLANNED DEAKIN UNIVERSITY MTEACH SCIENCE SPECIALIST PROGRAM: CONTEXT

- Declining participation in science – Government & Chief Scientist – and identification of primary schooling as a key stage for STEM engagement
- Increasing demand and marketing by schools as Science or STEM-focused
- MTeach is the postgraduate entry qualification – 3 semesters covering developing the knowledge and skills to become a primary teacher and 1 semester to develop a specialisation (inclusive education, leadership, research …)
- About one fifth of MTeach students have STEM qualifications and a similar proportion express a preference for a science specialism

DEAKIN UNIVERSITY AUSTRALIA Worldly

PRIMARY SCIENCE EDUCATION AT DEAKIN

1. Long history of primary school based science & technology curriculum units – strong relationships with schools
2. PrimSS: Deakin delivery of the Victorian Government Primary Science Specialists professional development program
3. Science Education Partnerships with Schools Project – model of collaboration

DEAKIN UNIVERSITY AUSTRALIA Worldly

PLANNED PROGRAM

- One term school based – integration of research into teaching curriculum implementation & leadership
- Two days at school – one at university
- Assessment integrated, portfolio, collection and analysis of evidence of student learning

Units (1 semester – F/T: 2 P/T):

1. Becoming an effective teacher of science
2. Resources in the contemporary science curriculum
3. Integration across the curriculum: STEM and sustainability
4. Leadership in primary science education

DEAKIN UNIVERSITY AUSTRALIA Worldly

COLLABORATIVE FORUM WITH PRE-SERVICE TEACHERS: A TABLE-BASED ACTIVITY

20mins

An opportunity to hear firsthand from pre-service teachers' who have participated in the Science and Mathematics Specialisation.

Questions to guide the conversation around the table:

1. How important is a Primary Science and Mathematics specialisation in current teaching and learning context?
2. What are your impressions of the quality of the experience the participants had throughout the specialisation?
3. If you were to be involved in implementing this type of specialisation in 2016, what would you do differently? Where would be your focus on improvement?
4. What opportunities would science and mathematics specialists provide for schools? And, how could/would the schools utilise the specialists?

COLLABORATIVE FORUM WITH PRE-SERVICE TEACHERS: YOUR FEEDBACK IS NEEDED!

10mins

Using your phones, or other devices provided in the room, enter your responses to the questions using the following URL:

https://www.surveymonkey.com/r/remstep