UNIVERSITY OF TECHNOLOGY SYDNEY

# 2016 First Year Experience (FYE) grants
# Embedding transition pedagogies in the curriculum

# Application form

Project applications (expressions of interest) must be submitted on this form.
Applications must be submitted by **10 am Tuesday December 8th, 2015.**

Applications are to be submitted by email to Kathy Egea, UTS FYE coordinator at Kathy.Egea@uts.edu.au .

**Project applicant/team leader:**

Name: Dr Yvonne Davila — Position: Lecturer, Higher Ed Learning Design

Contact email: Yvonne.Davila@uts.edu.au — Contact phone no: 9514 1749

Faculty: Science

**Other applicants if team application:**

Name: Ms Neela Griffiths — Position: ALL Developer (IML)

Name: Assoc. Prof. Peter Meier — Position: Associate Dean (T & L) (Science)

(PM acting subject coordinator at the time of application)

**Title of project:** Removing the cloak of invisibility: developing scientific writing practices for commencing Science students

**Transition subject involved:** 60001 Principles of Scientific Practice

**Endorsement by Associate Dean (Teaching and Learning)**

I …… endorse this project application and confirm that embedding of the project outcomes in the subject will be supported by the Faculty.

Signed

Date:

**Have you received one or more FYE Grants previously?**

**X Yes** – please attach a progress summary (max 1 page) for any 2015 grant that is not yet completed**.** Reports from earlier grants will be taken into account.

Please see final report for Davila, Griffiths, Beavis, Torpy - 'The ABC of PSP' 2015.

☐ No

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## Project outline (max 1-2 pages) (See guidelines for detail)

**A brief description of the aims and rationale for the project**

*'literacy is … as vital to science education as sails are to ships, bricks are to houses or engines to cars.'* (Osborne, 2002).

Many students who choose to study science at university underestimate the amount of writing required in the sciences, the level of proficiency expected, and are unaware of the discipline-specific academic discourse. Consequently, they are surprised and unprepared for the reading and writing skills demanded of them in the Science degree program. Building on our 2015 FYE grant (YD, NG) on embedding reading strategies into first year Science we aim to create interactive learning resources which will start to clarify scientific academic writing practices for all science students and particularly low SES students who 'without knowledge of academic culture and discourse … can be denied access to the academic knowledge community' (McKay and Devlin 2014, p. 959). Introducing students to the relevant academic discourse builds their academic cultural capital in the discipline-specific learning environment (McKay and Devlin, 2014) they will be part of throughout their course.

Our goal is to 'make the invisible visible' and demystify scientific academic writing for first year Science students. We will achieve this through embedding a series of bespoke interactive online resources into the first year Science subject 60001 Principles of Scientific Practice. These resources will complement the reading strategies modules and support the development of scientific writing for the diverse first year science student cohort. Students' confidence and capability will be developed using a flipped learning approach (Reyna et al. 2015) linking online activities to a face-to-face workshop.

Most commencing Science students enrol in the core subject 60001 Principles of Scientific Practice. The Faculty of Science has a large diversity of students with low SES students representing approximately 15% of students in 2014. Embedding the development of scientific writing practices in stage 1 of the Science curriculum supports transition for all students across all science disciplines and all pathways.

**First Year Curriculum principles for Transition Pedagogy addressed by the project (tick the appropriate box(es) Select the 1-2 strongest principles that you are addressing.**

Kift (2009) First Year Curriculum principles for Transition Pedagogy - http://fyhe.com.au/transition-pedagogy/fy-curriculum-principles/

- ☐ Transition
- ✓ **Diversity**
- ☐ Engagement
- ☐ Assessment
- ✓ **Design (broader focus)**
- ☐ Evaluation and Monitoring (broader focus)

**Provide detail of how the selected principle(s) is (are) addressed in your project.**

Design

*The first year curriculum is designed intentionally for commencing students, based on evidence from practice and research.*

Our goal is to develop students' confidence and capability in scientific academic writing at both the macro and micro levels through:

- Scaffolding interactive online resources that guide students through the writing process
- Identifying commonly used language, and 'harvesting' it for their own writing development (Amos and McGowan, 2012); differentiating levels of formality (building on and complementing our (YD, NG) reading strategies modules in PSP)
- Unpacking the rhetorical moves used in scientific article writing; for example, students will identify the stages (or moves) of a journal article introduction
- Developing data description skills (e.g. graphs and tables) as required in their scientific report
- Guiding students to write a methods section from a set of lab instructions

These skills will be practised and applied in the face-to-face workshop and will prepare students for the later years of their respective Science degrees.

Diversity

*The first year curriculum embraces and supports the diversity and reality of students' backgrounds, previous experiences and preparedness for university.*

Given the diversity within the large incoming Science cohort, using technology with its accessibility and flexibility enables inclusivity (Devlin et al., 2009). Furthermore, using a learning.futures approach engenders active and collaborative learning for students of all Science disciplines and pathways.

**Other University/Faculty/Course/Subject priorities addressed (optional)**

The use of flipped, active and collaborative learning approaches is aligned with the UTS Learning.Futures project.

**Key project activities and timeline, including appropriate activities that engage the overall teaching team (if applicable)**

60001 Principles of Scientific Practice is being redesigned prior to Autumn session 2016 to incorporate online delivery of all lectures. Our project timelines are dependent on this redesign and we expect to implement our new learning resources and activities into Spring 2016 session.

January to June

1. Curate existing materials (e.g. from discontinued Communication for Science subject) and designing new material for inclusion in online resources
2. Review changes made to Autumn delivery of PSP (change to online lecture delivery and workshop hours, ongoing review and communication with teaching team) to inform timetabling of online modules and workshop for Spring 2016
3. Storyboard content and collaborative learning activities to be included in workshops
4. Create Adobe Captivate interactive online modules, test, upload to UTSOnline
5. Train tutors to facilitate active and collaborative learning in the face-to-face workshops
6. Design student confidence survey (pre and post teaching session) and evaluation tool, and apply for ethics approval (Teaching and Learning application)

7. Mid-project report due

Preparation Week Spring session

8. Upload Preparation Week survey on student confidence levels on scientific writing practices to UTSOnline

Spring session

9. Week tbc (~7) - upload online resources to UTSOnline; promote online modules in workshops/announcements;
10. Week tbc (~8) - students complete interactive modules online and prepare for related workshop the following week; meeting with TAs to discuss activities in workshops
11. Week tbc (~9) - Workshop – Scientific writing practices
12. Review week – conduct end of session student confidence survey, and evaluation of online resources and workshop (survey and focus group)
13. Final report due

A casual academic will be employed to help with certain tasks as listed in the budget.

**Your evaluation strategy ie how you will know that the project has been successful, with particular focus on the transition pedagogies that you have chosen, and how will you collect information to improve the outcomes?**

- Compare before and after teaching session student confidence surveys
- Successful completion of online modules and engagement in workshops
- End of workshop evaluation OR post-assessment evaluation to assess student engagement and perceived value in the online tutorials and in the development of their scientific writing practices
- Focus groups

**Project Budget (**insert table or spreadsheet if appropriate) and budget justification (remember to add on-costs – approximately 17%) Salary rates: http://www.hru.uts.edu.au/conditions/pay/rates.html

| Activity | Hours | Rate | Total |
|---|---|---|---|
| Activities 1, 3, 4 (testing and uploading), 6 | 25 | Casual academic, other academic activity – PhD' rate projected at $53.03 per hour (May 2016 rate) including 17% on costs | $1551 |
| Activities 8, 9 and associated ongoing testing of modules | 15 | Casual academic, other academic activity – PhD' rate projected at $53.03 per hour (May 2016 rate) including 17% on costs | $931 |
| Activity 12 evaluation and triangulation with report results | 16 | Casual academic, other academic activity – PhD' rate projected at $53.85 per hour (Nov 2016 rate) including 17% on costs | $1008 |
| Survey evaluation incentives (vouchers) | | | $270 |
| | | **TOTAL** | **$3760** |

## References

Amos, K & McGowan, U. 2012, 'Integrating academic reading and writing skills development with core content in science and engineering', *Journal of Learning Development in Higher Education*, Special Edition: Developing writing in STEM disciplines, November 2012.

Devlin, M, Kift, S, Nelson, K, Smith, L & McKay, J. 2009, 'Effective teaching and support of students from low socioeconomic status backgrounds: Practical advice for teaching staff', *Office for Teaching and Learning*. *Department of Industry, Innovation, Science, Research and Tertiary Education,* Sydney.

McKay, J & Devlin, M. 2014, ''Uni has a different language . . . to the real world': demystifying academic culture and discourse for students from low socioeconomic backgrounds', *Higher Education Research and Development,* Vol. 33, no. 5, pp. 949-961.

Osborne, J. 2002, 'Science without literacy: a ship without a sail?', *Cambridge Journal of Education*, Vol. 32, no. 2, pp. 203-218.

Reyna, J, Davila, Y.C. & Huber, E. 2015, 'Designing your Flipped Classroom: an evidence-based framework to guide the flipped teacher and the flipped learner', *The 12th annual conference of the International Society for the Scholarship of Teaching and Learning*, 27-30 October 2015 in Melbourne, Australia.