

An Indian-Australian research partnership

<b>Project Title:</b>	<b>Using DEBE feedback to improve geoscience curriculum, teaching and learning</b>	
<b>Project Number</b>	IMURA0982	
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### Research Clusters:

### Research Themes:

Highlight which of the Academy's CLUSTERS this project will address? <i>(Please nominate JUST <b>one</b>. For more information, see <a href="http://www.iitbmonash.org">www.iitbmonash.org</a>)</i>		Highlight which of the Academy's Theme(s) this project will address? <i>(Feel free to nominate more than one. For more information, see <a href="http://www.iitbmonash.org">www.iitbmonash.org</a>)</i>	
1	Material Science/Engineering (including Nano, Metallurgy)	1	Advanced computational engineering, simulation and manufacture
2	Energy, Green Chem, Chemistry, Catalysis, Reaction Eng	2	Infrastructure Engineering
3	Math, CFD, Modelling, Manufacturing	3	Clean Energy
4	CSE, IT, Optimisation, Data, Sensors, Systems, Signal Processing, Control	4	Water
5	<b>Earth Sciences and Civil Engineering (Geo, Water, Climate)</b>	5	Nanotechnology
6	Bio, Stem Cells, Bio Chem, Pharma, Food	6	Biotechnology and Stem Cell Research
7	Semi-Conductors, Optics, Photonics, Networks, Telecomm, Power Eng	7	<b>Humanities and social sciences</b>
8	HSS, Design, Management	8	Design

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### **The research problem**

*DEBE data has been shown to indicate student affect and cognition during large lectures. The underlying principle behind DEBE feedback is rather simple : if we sample a large enough student population (e.g., large lecture classrooms) and ask the student to provide anonymous feedback on difficult, easy, boring and engaging (DEBE) sections of a lecture then that feedback can be a) used to improve instruction and teacher reflection b) understand cognitive-affective dynamics in the classroom c) instrumental in fostering student metacognition that can promote learning (tentative) and d) used in objective assessment of teaching (tentative). Ongoing research by one of the supervisor's PhD student is helping in the understanding a) above. With this project we plan to make progress in b, c and d.*

### **Project aims**

- 1) Collect DEBE feedback in year 1 with the tool that was developed at IIT Bombay for large lecture classrooms at Monash University*
- 2) Use the data to address b and c above*
- 3) Use the data to refine lecture materials and collect DEBE feedback in the same classroom in Year 2/3 so as to evaluate the potential of DEBE data in objective assessment of teachers (point d above)*

### **Expected outcomes**

*Publications in top journals or the top conferences in this field (e.g., LAK)*

### **How will the project address the Goals of the above Themes?**

*Education is a key humanities and social sciences prerogative and this project will create a roadmap for institute-wide implementation of such feedback system (at Monash University and/or at IIT Bombay) to foster both student learning and teacher reflection, training and assessment.*

### **Potential RPCs from IITB and Monash**

*Prof. Ramkumar Rajendran is learning analytics expert and will be on the RPC from IIT Bombay. His expertise will be useful to analyse and interpret the large volume of data that we*

### **Capabilities and Degrees Required**

A STEM background is necessary. An Earth Science relevant background and/or a quantitative modelling experience will be a plus. Knowledge of a programming language (Python/R) is desirable.

### Necessary Courses

*Name three tentative courses relevant to the project that the student should complete during his/her coursework at IITB (the student will require to secure 8 point in these courses)*

*Learning Analytics  
Statistics for Educational Research  
Research Method in Educational Technology*

### Potential Collaborators

*Dragan Gasevic from Monash University and Ramkumar Rajendran from IITB could be potential collaborators*

Select up to **(4)** keywords from the Academy's approved keyword list (**available at <http://www.iitbmonash.org/becoming-a-research-supervisor/>**) relating to this project to make it easier for the students to apply.

**Miscellaneous, geoscience, data science**