Building sustainable psychological wellbeing through the Science of Learning

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Science of Learning
iExplore STEMM module

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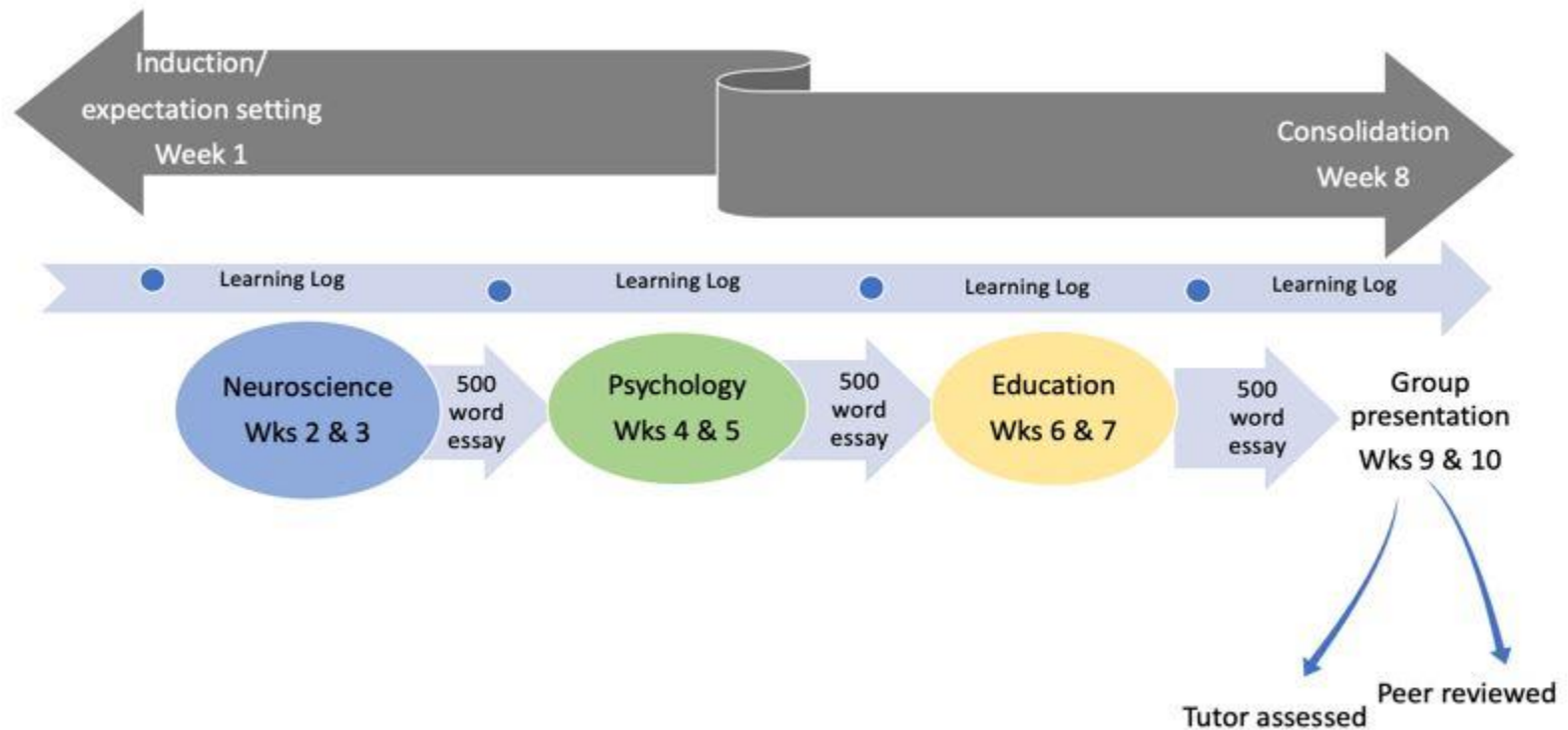
About iExplore STEMM

- Available to **all** Imperial UG students in their 2nd or 3rd Year

- 10-week long, 5 ECTS that count towards main degree

- Module grade does **not** impact overall Degree grade outcome but must be passed

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Neuroscience

Biological basis of learning

Affective

Neurodivergence

Psychology

- Educational

- Social

Sociology

- Peer learning

- constructivism

Consideration of their application in teaching-related contexts through **reflection on own experience**

Scaffolded & Developmental Assessment

- Topic-based formative essays
  - Neuro/Psych/Soc – 500 words each
- Continuous reflective learning log (10 weeks)
- Group presentation
  - Peer feedback element

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Induction/expectation setting Week 1

Consolidation Week 8

Learning Log ● Learning Log ● Learning Log ● Learning Log

Neuroscience Wks 2 & 3 → 500 word essay → Psychology Wks 4 & 5 → 500 word essay → Education Wks 6 & 7 → 500 word essay → Group presentation Wks 9 & 10

Tutor assessed ← → Peer reviewed

What do we mean by emotion in learning?

- Neurologically impossible to remember material, engage in complex thoughts, make meaningful decisions, transfer classroom learning to real life without emotion (Immordino-Yang, 2016).

- "Emotions are both experienced in educational settings as well as instrumental for academic achievement and personal growth" (Pekrun & Linnenbrink- Garcia, 2014: p.1).
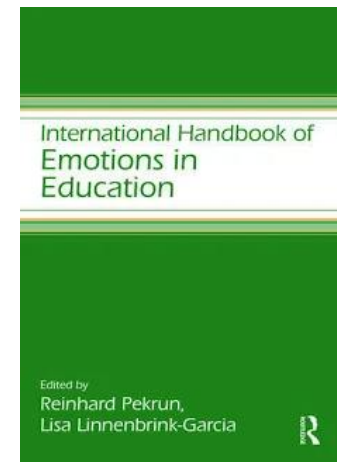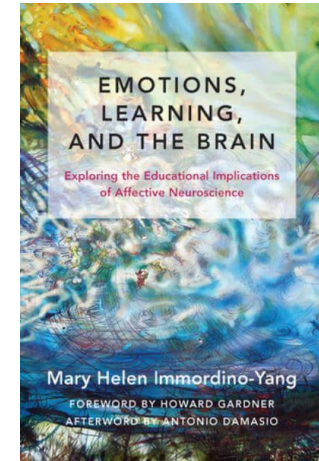
'How to become an emotion scientist'
Prof Marc Brackett, Yale
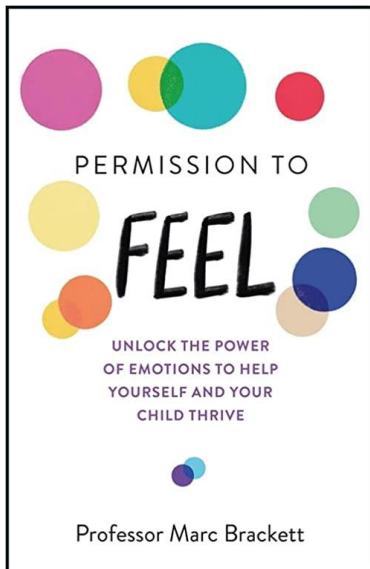
- **R**ecognising the occurrence of an emotion

- **U**nderstanding the cause of the emotion

- **L**abelling – accurately describing an emotion

- **E**xpressing – knowing how and when to display our emotions

- **R**egulating – monitoring and modifying emotional reactions to reach goals

(Brackett, 2019: 55)

Making sense of emotions experienced in learning

		Emotional Valence	
		Positive (Pleasant)	**Negative (Unpleasant)**
Activation of Learning	**Activating**		
	Deactivating		

Based on Pekrun & Perry (2014), Pekrun et al (2017)

Achievement emotions

Epistemic emotions

Pride

Enjoyment

Hope

Frustration

Shame

Boredom

Confusion

Anxiety
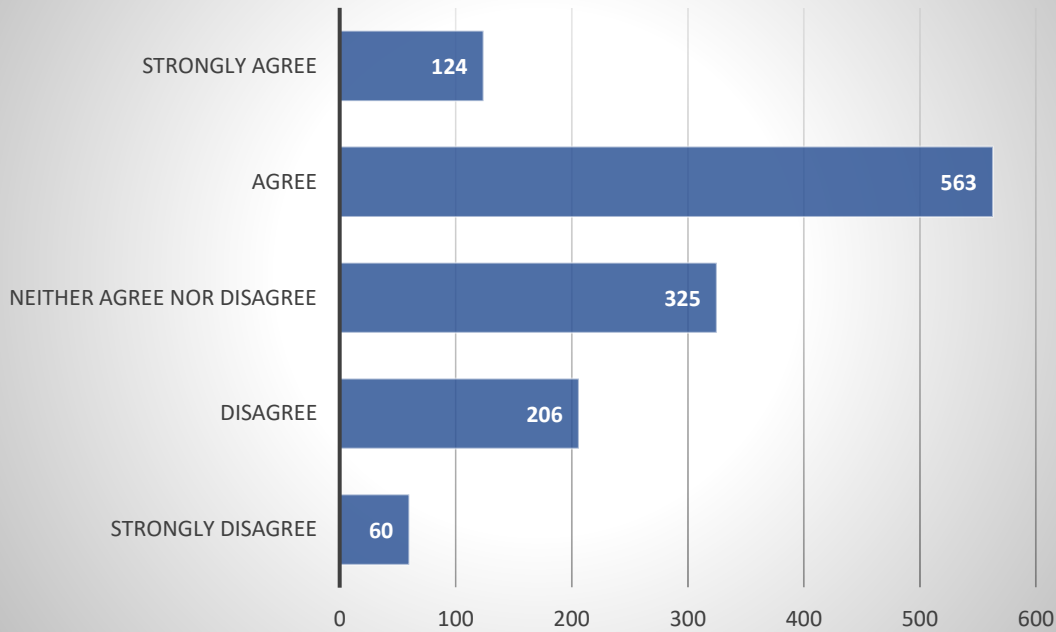
Surprise

Anger

Curiosity

Relief

Hopelessness

Control – Value Theory
of Achievement Emotion

Control e.g. Do I have any choice?
Am I competent at this?
Value e.g. Is this interesting / useful
to me?

Class-related Enjoyment

Response	Value
STRONGLY AGREE	124
AGREE	563
NEITHER AGREE NOR DISAGREE	325
DISAGREE	206
STRONGLY DISAGREE	60

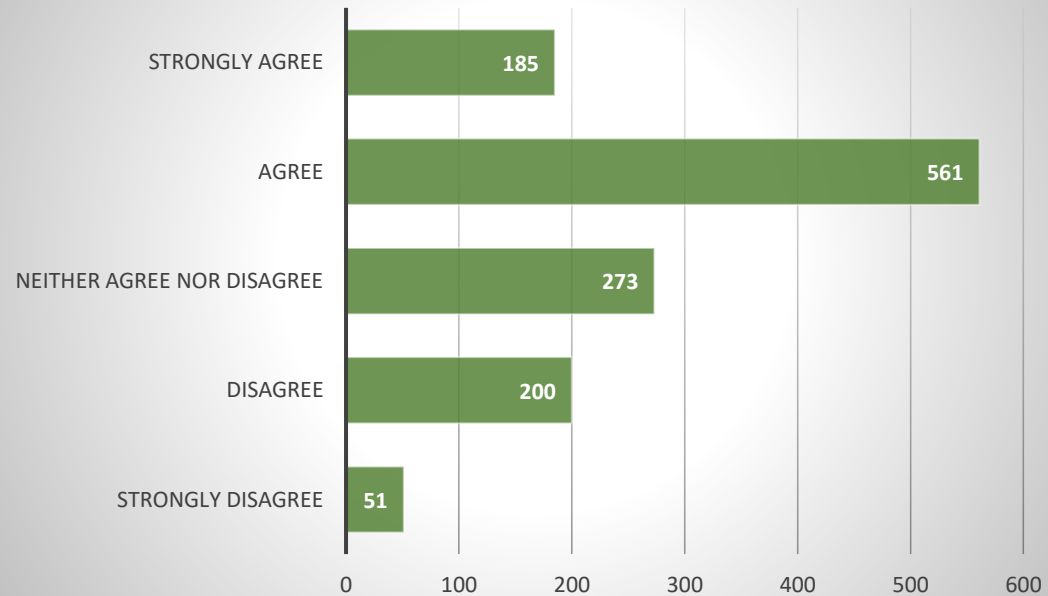"My enjoyment of this class makes me want to participate." 70% Agree

"I enjoy acquiring new knowledge." 90% Agree

Learning-related Enjoyment

Response	Value
STRONGLY AGREE	185
AGREE	561
NEITHER AGREE NOR DISAGREE	273
DISAGREE	200
STRONGLY DISAGREE	51

(Pekrun, Goetz & Perry, 2005)

In pairs discuss:

What makes you want to participate?

Why do you like acquiring new knowledge?

(2 mins)

When first entering this week's session I found myself very **anxious**. I was worried that I would be out of my depth…

I think that these emotions emerged because I feel that I must meet the level of ability of those students around me that may have more experience. This **helped me to focus** on the activities as I didn't want to appear misinformed, but for the same reason I was also **less willing to share my opinions**.

However, as the session progressed I **gained confidence** in not being judged. I found the ability to talk through different ideas of the impact of emotions and finding out my peers' thoughts on the topic enlightening. I hope that this is something that I will be able to **transfer to my degree** allowing me to speak about how I think a problem should be approached without the worry of others believing I am inferior.

Reflection leading to increased self-awareness and agency

Going over the questionnaire, it made me realize that a lot of my colleagues **feel the same way** about certain things and I am **not alone** (eg: feeling stressed).

It was really encouraging to meet some new people and realise that we are actually going through the same thing with **similar struggles**. Apart from that, participation in discussions...was highly encouraged by the module lead so I felt **brave** for stepping up and talking. This whole idea of volunteering to talk in the general discussion, has really helped in my course too over the last few weeks, where I slowly realise that it is **not that scary after all**.

Psychological safety

Returning to the topic of the 1st session with some specific references to activities from that 1st session was great for reflection

It was noticeable how much better the discussions were compared to the first week, with people actually discussing the underlying reasons for an emotion or ways to harness an emotion for a task.

Sustainability and Self-efficacy

While the social aspect for me is the least interesting […] by linking it to other theories and ideas I can relate to it more so I think it really helped gaining the bigger picture of this module.

Facilitating a habit of reflection

Achievement Emotion Questionnaire

Reflective learning logs

Purpose of Achievement Emotion Questionnaire and Padlet learning log:

- to raise your awareness of the range of emotions associated with learning, how it's normal to experience this range and how you can work with them.

- this regular reflection will help you consider aspects of the module as you progress, reveal how your thinking and attitudes may change and help you with the assessment

- it is much more effective if you complete it as you go.

Padlet Learning Logs

How did this week's session make me feel?

Why do I think I feel this way?

How does what I've learnt relate to experiences of learning on my degree?

ILOs as assessment criteria

•**Critically evaluate** the process of learning from a neurological, psychological, and socio-cultural perspective

•**Reflect** on your learning experiences using the neurological, psychological, and socio-cultural theoretical perspectives

•**Critique** how neurological, psychological, and socio-cultural perspectives are (mis)applied in a range of pedagogic contexts

•**Identify** significant pedagogic challenges and/or opportunities and design appropriately theoretically-informed interventions

Habitual reflection: What's the value for students and teachers?

Students

Realising value of ideas and interactions

Increased self-awareness and agency

Making personal meaning and connections

Insight into development over time

Teachers

Timely feedback

Getting to know the students

Source of motivation

Insight into impact on learning

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How did we encourage sustainable reflection?

- No direct teaching on how to reflect – rather modelling the kinds of questions you might ask yourself…
- Gave scaffolded stimulus for personal meaning-making
- Use simple questions to prompt reflections
- For authentic reflection leave space for them not to reflect
- Make it anonymous
- Pass/fail, Must pass = No
- Don't feel you need to give examples – can give general feedback

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