

“Walking is the best medicine”



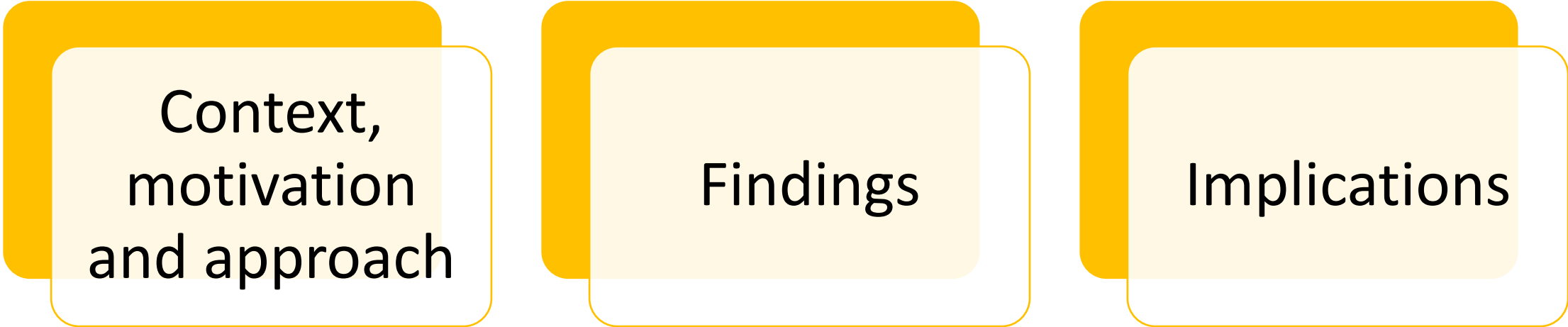
Hippocrates

Pitching Pharmacology for Master's Level Learning: Purposefully Walking with Waymarks

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University Learning and Teaching, 2020

Pharmacology – The Science of Drugs

Structure of talk



Context,
motivation
and approach

Findings

Implications

1. Context, motivation and approach



Context

Lecturer in NHLI, FoM; co-lead pharmacology modules on GDS MSc

Studied pharmacology at BSc & PhD

What is pharmacology at Master's?

GDS students work in team on a commercialisation strategy for a novel drug therapy; and write a grant

British Pharmacological Society (BPS) guidelines for UG, not PGT

I became curiouser and curiouser...

'Curiouser and curiouser!' cried Alice
(she was so much surprised, that for the moment she quite forgot how to speak good English).



Motivation

Chatting to a GDS student (on this bench); she said: “We did genes, drugs and stem cells...but what am I a Master of?”

Got me thinking ... what is it to be: ‘**a master of pharmacology**’?

A quick search found a paper: *‘Postgraduate taught students and preparedness for Master’s level study: Polishing the Facets of the Master’s Diamond’* (Bamber, 2017) - and that was the start of my MEd!



Bamber V, Choudhary CJ, Hislop J, & Lane J (2019). Postgraduate taught students and preparedness for Master’s level study: Polishing the facets of the Master’s diamond. Journal of Further and Higher Education 43: 236-250.

What is mastersness? A discussion paper

Quality Assurance Agency Scotland proposed a framework of **seven facets** that underpin Master's level study; called this concept **mastersness** (QAA, 2013)

The facets: abstraction, autonomy, complexity, depth, professionalism, research, unpredictability

Stimulate discussions on study at Master's level with staff/students; nothing about how facets apply to specific disciplines



Approach

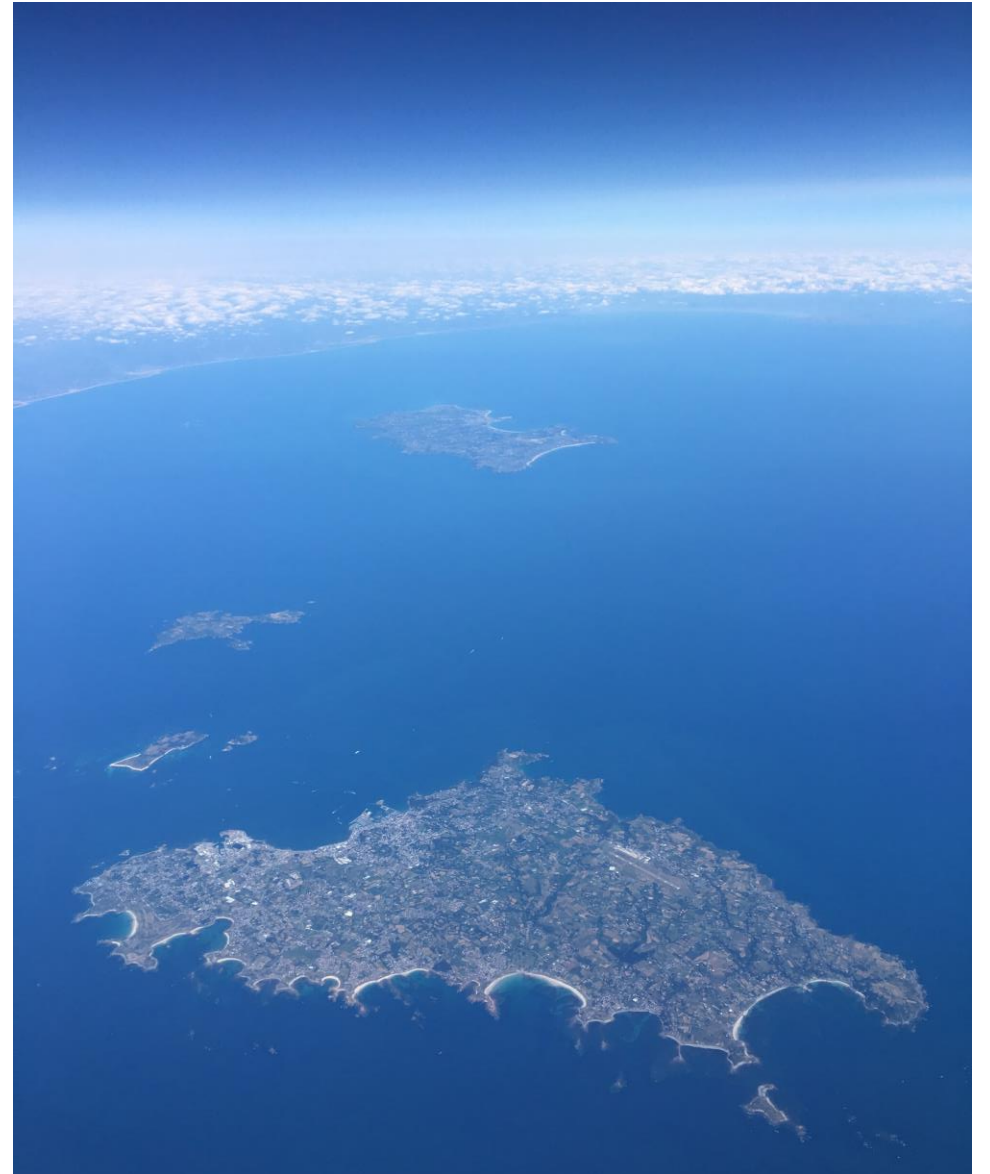
Aim was to investigate facets of mastersness in pharmacology.

The primary research question:

What are teachers' perceptions of how mastersness in pharmacology is developed through PGT courses in the UK?

The secondary research question:

Is mastersness a generic concept only, or are there discipline specific elements?



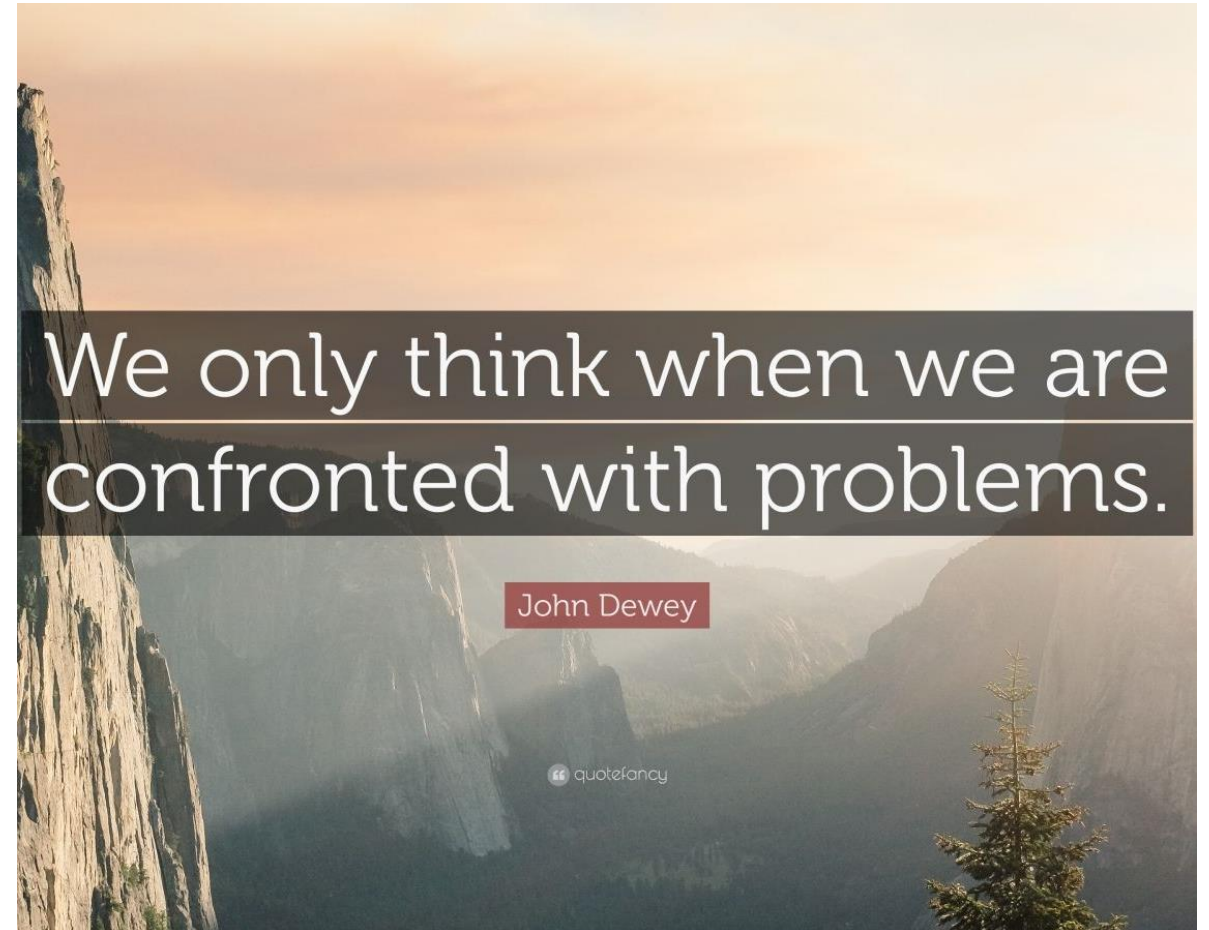
Methodological rational

Phenomenological approach: teachers' perceptions of mastersness in pharmacology MSc courses (UK)

Documentary ethnography of course webpages; **survey** of pharmacology teachers; **interviewed** teachers

Conceptual framework: facets of mastersness guided questions.

Theoretical lens: John Dewey's on learning through authentic experiences and problem solving in a social environment (Aubrey, 2016, pp 6-7)



Personal perspective: “interested observer”

Ethics: Education Ethics Review Panel, 1920-038

Course webpages

Searched for Master's courses with 'pharm' or 'drug' in the course name.

Excluded: Master's by Research, MPhil or MSc/PhD programs (focus was PGT)

Included: 41 courses, 5 categories

Webpage image: for each documented

URL: analysed with a Word Cloud programme

Course title	University
Pharmacology/advanced pharmacology	
Pharmacology	Bedfordshire
Pharmacology	Kings College London
Pharmacology	Nottingham Trent
Pharmacology	Oxford
Advanced pharmacology	Strathclyde
Drug discovery and/or development and/or delivery	
Drug Discovery & development	Aberdeen
Drug Delivery	Aston
Drug Discovery	Bath
Drug Discovery and Development	Central Lancaster
Drug development science	Kings College London
Drug Discovery, development and delivery	Liverpool John Moores
Applied drug discovery	Medway
Clinical Drug Development	Queen Mary
Drug Discovery and development	Sunderland
Courses with 'pharmaceut...' in the name	
Pharmaceutical Science	Anglia Ruskin
Pharmaceutical Science	Aston
Pharmaceutical biotechnology	De Montford
Pharmaceutical Science	East London
Pharmaceutical Science	Greenwich
Pharmaceutical and analytical science	Huddersfield
Pharmaceutical Development	Keele
Biopharmaceuticals	Kings College London
Pharmaceutical technology	Kings College London
Biopharmaceutical Development	Leeds
Pharmaceutical Science	Robert Gordon Aberdeen
Pharmaceutical Science	Ulster
Courses with two of the previous elements in the name	
Pharmacology and drug discovery	Coventry
Drug Discovery and Translational Biology	Edinburgh
Pharmaceutical Science and Drug Delivery	London Metropolitan
Drug Discovery and Pharmaceutical Science	Nottingham
Pharmacology and Drug Development	Hull-York

Survey

Survey to 51 UK teachers (19th March '20)

Survey to 37 GDS MSc teachers (Plan B!)

Participants asked to: rank facets in order of **relevance** for study at Master's

Questions were asked on:

- how students developed the facets
- are there pharmacology-specific facets?

Depth	Professionalism
Abstraction	Research
Complexity	Unpredictability
Autonomy	?

Semi-structured interviews

Participants asked about **perceptions** of pharmacology at Master's level

Views on teaching, learning and assessment of facets, and pharmacology-specific facets

Listened to/transcribed the interviews (1)

Tabulated answers to the questions to collate data (2)

Thematic analysis to search for emergent themes (3)

7 interviews (3 UK + 4 GDS), 80,000 words



Sub-themes	1	2	3	4	5	6	7	Total
Help/ support/ encourage	✓		✓	✓	✓	✓	✓	6
Working together	✓		✓	✓		✓		4
Forging links				✓			✓	2
Provide explanation/ framework	✓		✓	✓				3
Feedback/validate	✓		✓	✓		✓		4
Show/guide		✓	✓	✓		✓		4
Peer support/work	✓	✓	✓	✓	✓	✓	✓	7
Providing tasks, opportunities, problems to solve etc	✓	✓	✓	✓	✓	✓	✓	7
Time for discussion: formal and/or informal			✓	✓	✓	✓	✓	5

2. Findings



Webpages

Word clouds: two-thirds of courses had 'research' in their top ten words, based on frequency

Webpage images: over half of courses showed students/staff in a wet-lab as their main image

Might suggest, at a first glance, research (wet-lab), is an important component of taught pharmacology MSc programmes in the UK

Or just easier to photograph...!



Webpage Image Drug for University of Nottingham Drug Discovery and Pharmaceutical Sciences MSc

Survey

26 responses (UK 6, GDS, 20); facets ranked 1 to 7 by GDS teachers (similar for UK teachers)

Pie calculated from times facet is ranked 1 to 3

1st Autonomy and research (11 votes)

3rd Abstraction (7)

4th Professionalism & Depth (4)

6th Unpredictability (3)

7th Complexity (1)



Interviews: Primary research question

What are teachers perceptions of how mastersness in pharmacology is developed?

Interviewees discussed development of **research** and **autonomy**; one other facet

Points raised: facets are blended; no mention of emotions and feeling; also highlighted in “What is Mastersness? Discussion paper”

Autonomy is the essence of Master's



How do students **learn autonomy**?

Suggestions ranged from encouraging students:

To do their own research for assessments, literature reviews, grant applications and lab work (Int 5).

To form a framework that they build on (Int 4); let them make mistakes then think about ways that they can improve (Int 1).

Student-led tasks, facilitated by the staff are important (Int 6).

On **teaching autonomy**:

'hold their hand... check and guide' (3); to you can encourage, not teach; you need to be 'a bit more hands off' (7). Activities to teach autonomy can include: debates... allowing them [students] to make suggestions for the [research] project (6)

Interviews: Secondary research question

Are there discipline specific elements?

I suggested **interdisciplinarity** because pharmacology works across disciplinary boundaries

Most agreed that it could be an extra facet but not specific for pharmacology

Thematic analysis of interview transcripts revealed four over-arching themes....

(From which I hoped to find other facets...)



Over-arching themes

Master's as...

Journey: not a new; can be applied to all levels of study

Challenge: sub-themes - inexperience and dealing with 'scientific' failure (experiments don't go as planned!)

Maturity: growth as a person was a top sub-theme

Interaction: working with peers, teachers and problems



Evidence for Master's as interaction

Working with peers to solve problems; facilitated by teachers....

'So, you know, you give them a problem... and you ask them to go away and investigate and come back and present. And then the team or the group looks at the problem and comes back and discusses it. And this is... only facilitated by the staff rather than led by the staff'
(Interviewee 6).

'Ultimately, the student needs to make their own decisions, but there needs to be multiple points at which you check what they're doing and help guide them toward making the right decision, so that... they will learn the process and not just answer the specific question that you've given them'
(Interviewee 3).

Is interaction a facet for pharmacology?

Yes!

Developed by working to solve pharmacological problems with peers and enabled by teachers

Resonates with Dewey:

'learners need direction... teachers have a responsibility in facilitating learning by encouraging... and motivating so that they can develop intellectually' (Aubrey 2016, p6)

I've done a tutorial session on how to build physiologically based pharmacokinetic models... I then get them to go away and read that paper and others in detail and a week later we come back and break out into little groups... they then talk about the important bits of any physiologically-based pharmacokinetics models, the limitations or the uses for it, where the future lies with it (interviewee 7).

Facets developed together

Current GDS students working independently/with peers/with us to 'unpack' a complex paper



ARTICLE

<https://doi.org/10.1038/s41467-019-13139-9>

OPEN

A therapeutic antibody targeting osteoprotegerin attenuates severe experimental pulmonary arterial hypertension

All the facets come into play when engaging with disciplinary literature!



3. Implications



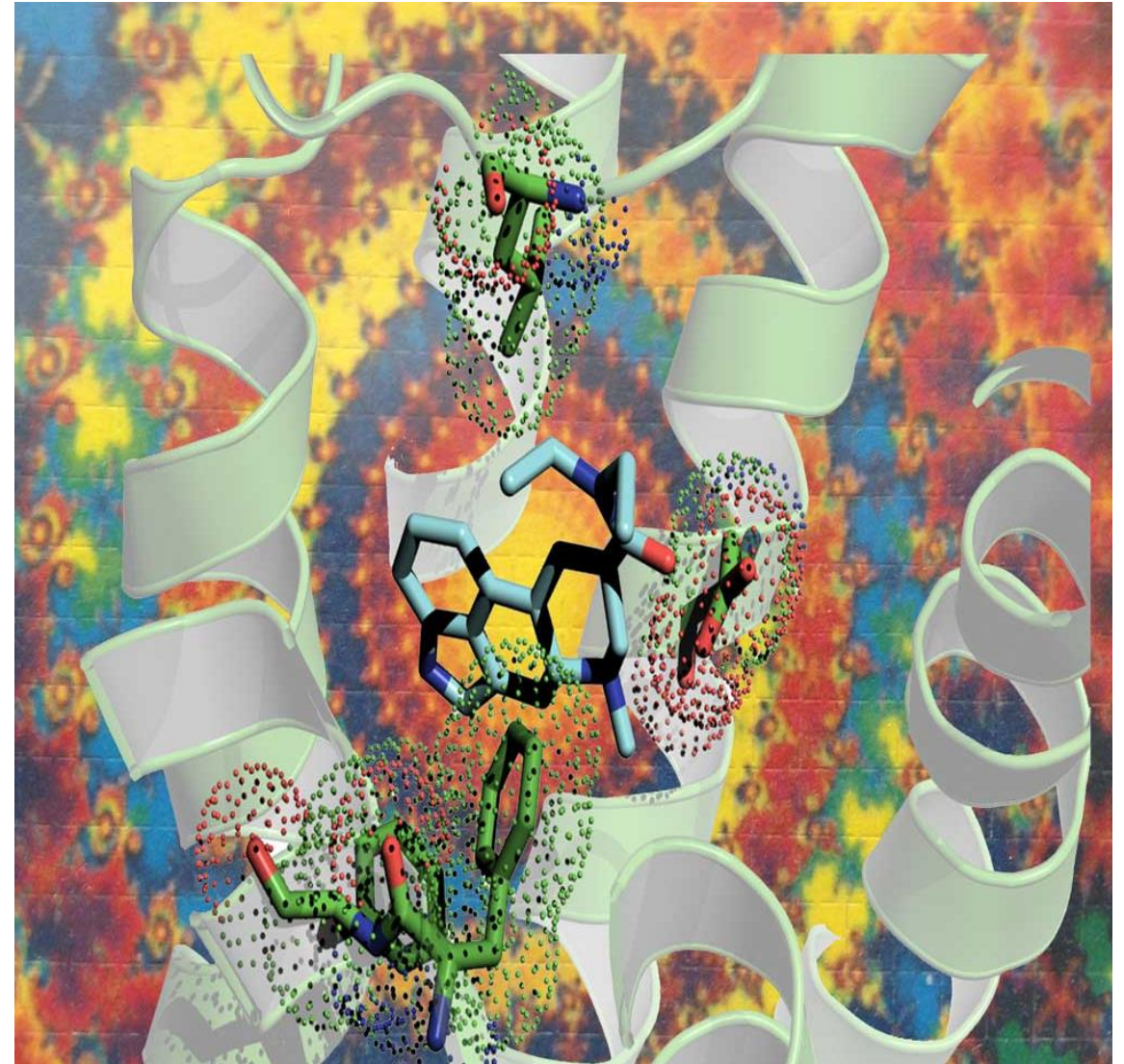
Summary

Research and autonomy are key facets of pharmacology mastersness (autonomy is a 'balancing act' for teachers)

Interdisciplinarity is a relevant, additional facet for pharmacology

Interaction is a key, additional facet that underpins pharmacology (at all levels!); but could also be a general mastersness facet

Study limitations: small response to the UK survey but findings backed by GDS MSc survey and literature



Artistic impression of drug interaction with receptor

Directions/Conclusions

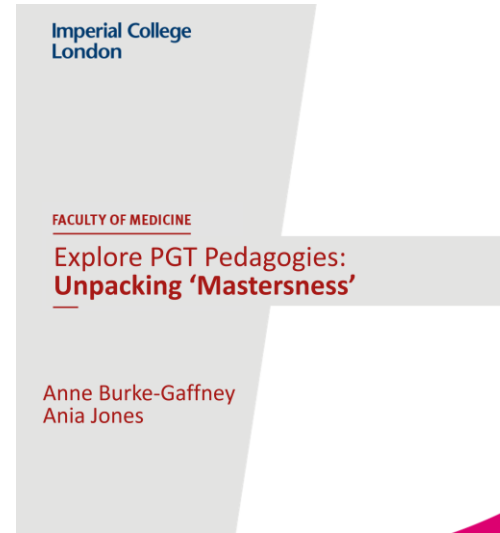
Future directions:

‘Unpacking Mastersness’ workshops for PG staff/ FoM
Guidelines for pharmacology at Master’s with the BPS

Conclusions:

Overall, I hope that this study will encourage:

- pharmacology teachers to consider facets of mastersness when designing teaching for Master’s
- other disciplines to analyse their courses/modules through the lens ‘mastersness’



**BRITISH
PHARMACOLOGICAL
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Final reflection

If Master's level study is a journey, walk it...

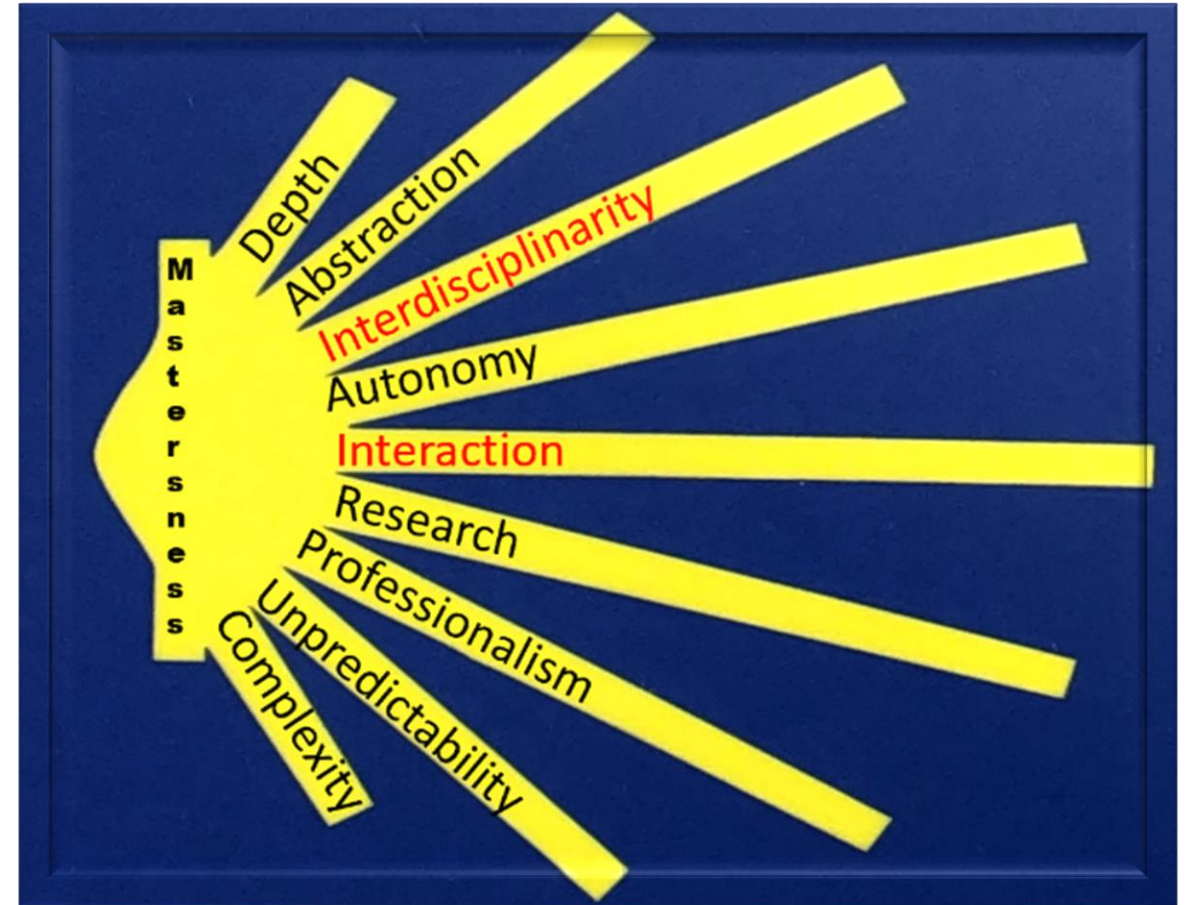
Give yourself enough time to:

Stop and interact with others along the way...

And if needs be, solve problems...

And ask yourself:

“How am I doing (on these Mastersness facets); am I a master (of pharmacology) yet?”



Acknowledgements

My **pharmacology colleagues** - for their wisdom and conversations

The **Master's students** I have worked with and learned lots from

A big thank you to **my supervisor**, Professor Martyn Kingsbury and all EDU staff

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My **family** - for letting me take over the kitchen table

And all those I met and 'interacted' with, on the Camino, in Northern Spain, 2019

