

Oh my pod!
Teaching experimental biomedical
science to undergraduates
in research-intensive ^{learning} teaching labs

Ana P. Costa-Pereira



What is wrong with lab practicals?

- ✓ One time event
- ✓ Staged
- ✓ Incomplete procedures
- ✓ Superficial reports
- ✓ Evidence that they can actually do more bad than good

- Single protocol provided

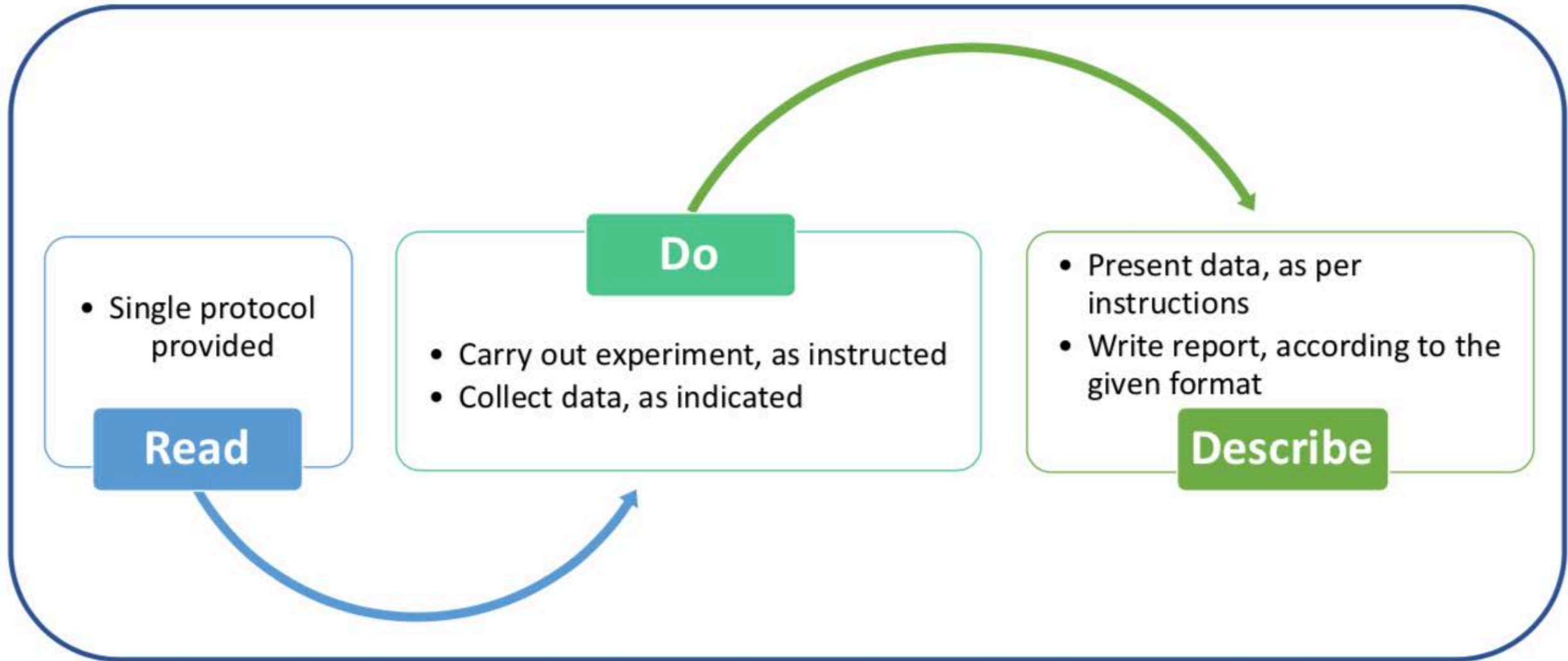
Read

Do

- Carry out experiment, as instructed
- Collect data, as indicated

- Present data, as per instructions
- Write report, according to the given format

Describe



Level	0		1	2		3
Grade	0	1/2	1	2	2 1/2	3
Enquiry Type	Confirmation	Structured Enquiry	Guided Enquiry	Open Enquiry	Free Enquiry	Authentic Enquiry
Hypothesis	Provided	Provided	Provided	Provided	Not provided	Not provided
Background	Provided	Provided	Provided	Provided	Provided	Not provided
Experimental Design	Provided	Provided	Provided	Not provided	Not provided	Not provided
Results Analysis	Provided	Provided	Not provided	Not provided	Not provided	Not provided
Discussion	Provided	Not provided	Not provided	Not provided	Not provided	Not provided
Future Perspectives	Provided	Not asked	Not asked	Not asked	Not provided	Not provided



Complexity

Rubric designed to characterise the level of inquiry in higher education laboratory curricula (adapted from Buck et al., 2008).



Lab Pod: where magic happens...





What is a Lab Pod?

- ✓ Run like a real research lab
- ✓ Hypothesis-driven research project
- ✓ 1 day per week throughout the academic year
- ✓ Focus on scientific rigour and the mastering of basic biomedical research techniques
- ✓ Analytical and transferable skills



Lab Pod: where magic happens...



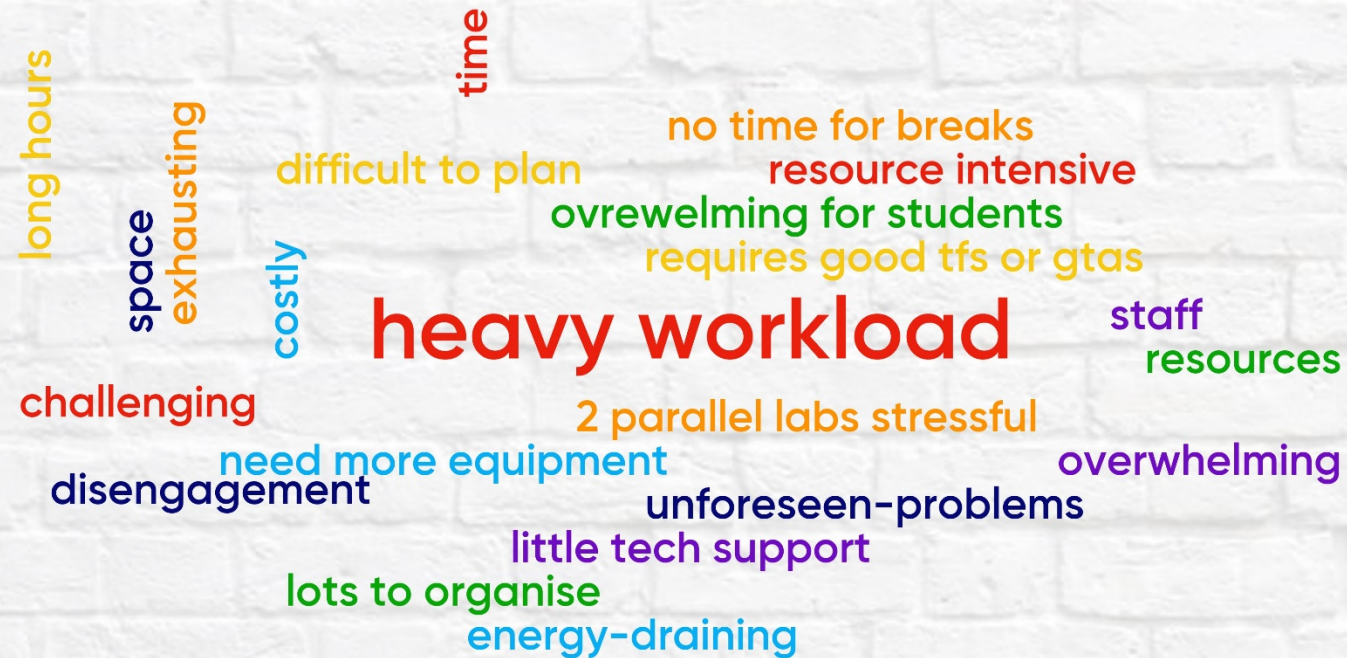


Lab Pod: where magic happens...



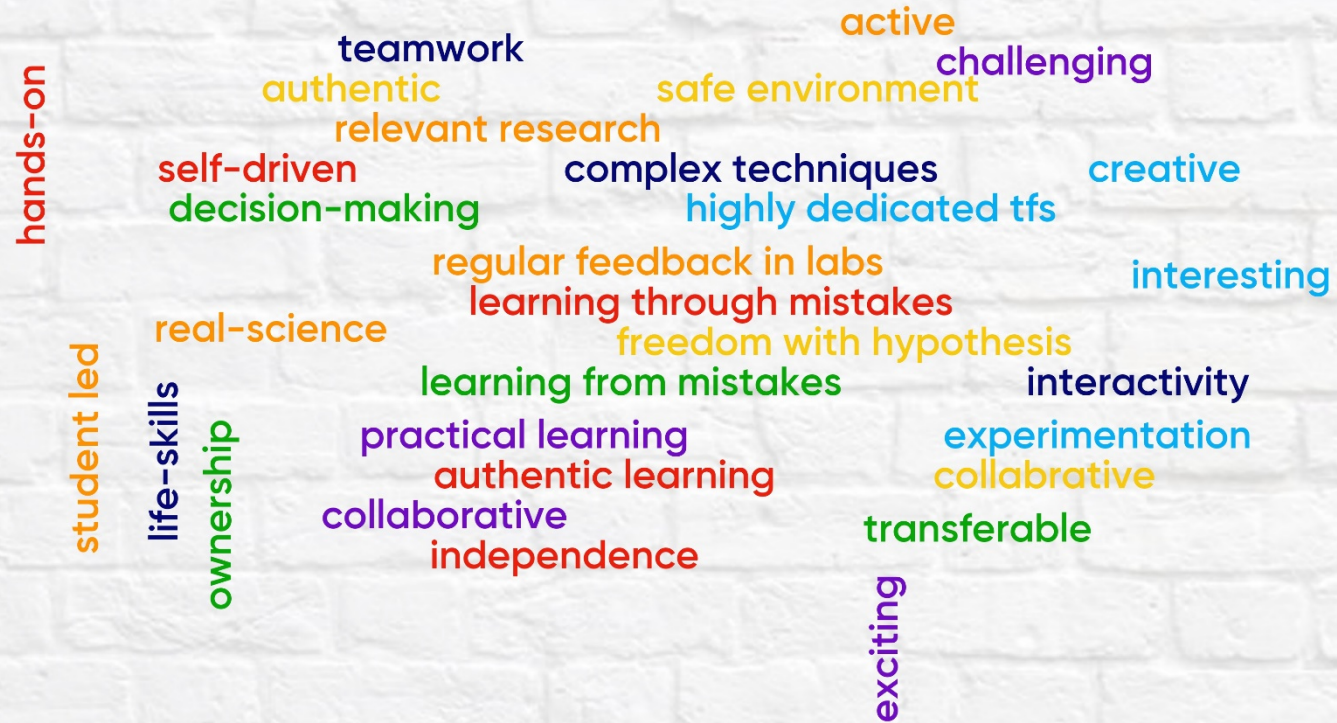


When you think about what is bad regarding the teaching in the LPs you think:





When you think about what is good regarding learning in the LPs you think:





When you think about what is bad regarding learning in the LPs you think:

long-hours

confusing

superficial

rushed

disengagement

time management

difficult to measure

teams hide non-workers

complex too soon

uneven exposure

anxiety

independent

demotivating

overwhelming

pressure

storming

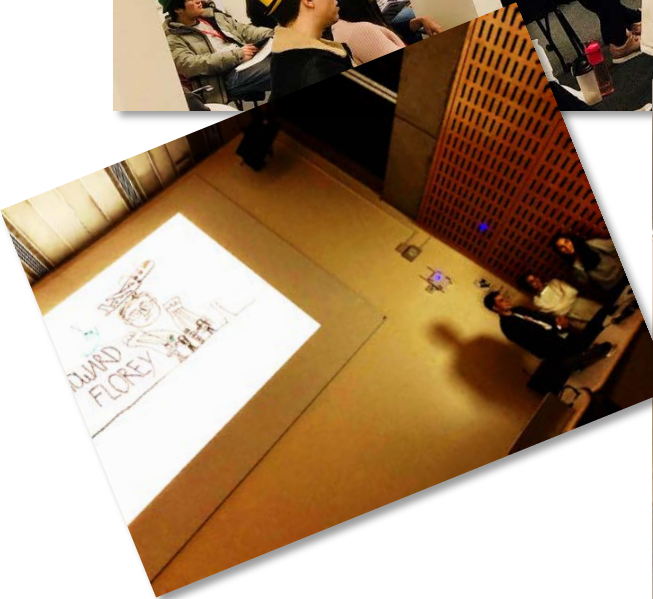
monitoring

stress

conflict



Getting 'those' skills...





Lessons learnt

- Authentic learning labs are resource intensive
- Lab Pods require highly qualified and trained staff
- Lab Pods require technical support

However...

- Rewarding for students and staff
- Learning happens almost by osmosis
- Students feel a huge sense of achievement and pride when 'things' finally work!



Acknowledgments

BMB Teaching Fellows (present)

- Kirsty Flower
- Luisa Garcia-Haro
- Jacqueline Dickson
- Laura Collopy
- Alwyn Dart
- Manuela Mura
- Silke Kerruth
- John Logan
- Andreia Vargas-Seymour
- Mahsa Samadi
- Phillip Lawton
- Shmma Quraishe

BMB Teaching Fellows (past)

- Jeni Harper
- Charlotte Clark
- Agirta Zalli (Apr-Oct 2017)