As academics we are responsible for the training, intellectual development, and general well-being of the postgrads in our research groups. We need to invest heavily in their development and ensure they get the most out of their time at Macquarie. To this end, we need to make sure our research groups (or labs) are supportive, vibrant, keep students engaged, and are productive. This is also a selfish goal, because we ultimately need to meet our obligations to funders and publish our work. One of the burning questions in academia is why some students are highly motivated throughout their candidature while others burn out and lose motivation after a year or two. I will highlight some ways to address this issue. The goal of this workshop is to outline ways to run an organised, engaged, and stimulating research group.
Ultimately we want a happy and productive lab—these are the themes or topics we will cover that help us meet that goal.

1. Motivation
2. Philosophy and culture—being engaged
3. Communication and being organised
   1. RG portfolios
   2. RG manual
   3. Slack, other software
   4. RG meetings—how to keep them interesting and engaging
   5. Small groups
Motivation is crucial to any endeavour and it’s especially important in academia and for successfully attaining a postgraduate degree.
The importance of motivation

HOW CAN WE ENHANCE MOTIVATION?

The two common scenarios:

**Student 1**: passionate, experiences personal & intellectual growth, can’t wait to get to uni., thrives

**Student 2**: quickly loses motivation, depressed, loath to look at own data, burns out

And students along that continuum. These are scenarios that every academic will experience in their careers if you haven’t already. Even really good students will struggle with motivation to varying degrees.

Student 2 may be a PhD student after 2 years.
In the past we simply blamed students and said they lacked motivation. We need to take some responsibility and be proactive. We can create conditions that help motivate students. It turns out there is an entire field in psychology and organisational behaviour that probably many of you are familiar with, in Self-determination Theory (SDT). There are entire research centres that focus just on this issue. Given the importance of motivation to success and well-being and how motivation permeates so many aspects of our lives this is not too surprising. SDT has 6 mini-theories that relate to the three conditions.


https://selfdeterminationtheory.org/theory/
The importance of motivation

HOW CAN WE ENHANCE MOTIVATION?

<table>
<thead>
<tr>
<th>Competence</th>
<th>Autonomy</th>
<th>Social connectedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task difficulty (example):</td>
<td></td>
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<tr>
<td>Too difficult = loss of motivation/self-confidence</td>
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<td>Too easy, little reward</td>
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<tr>
<td>Intermediate difficulty (best; can break into parts)</td>
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<tr>
<td>Define a skills set, training plan (early). What sort of expertise is needed?</td>
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The progress principle

“Of all the things that can boost emotions, motivation, and perceptions during a workday, the single most important is making progress in meaningful work. And the more frequently people experience that sense of progress, the more likely they are to be creatively productive in the long run.” “…even a small win can make all the difference in how they feel and perform.” Amabile & Kramer 2011 *Harv. Bus. Rev.*

In an early meeting, talk about what sort of professional they want to become and what skills they think they need. Then start planning on how they can acquire those skills. For example, for our field a key skill is competency in R and mixed effects models. It might also be writing, public speaking, programming, lab work, etc.

Useful resource: https://www.scientifica.uk.com/neurowire/lab-management-10-tips-for-motivating-your-research-group

The progress principle is based on daily surveys over 3 months of 26 project teams from 7 companies, comprising 238 individuals. This produced nearly 12,000 diary entries.

Harder to make progress if you lack the necessary skills.
Most students like getting some direction. Like many things in life, getting the balance right is the challenge.

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### Ways to enhance social connectedness
Particularly important when students are struggling.

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<td>Define a skills set, training plan</td>
<td>Give them power to direct a project</td>
<td>Benefits of team work: increased productivity, performance, skills development</td>
</tr>
<tr>
<td>Task difficulty:</td>
<td></td>
<td>Groups offer support network; a culture of caring/support</td>
</tr>
<tr>
<td>Intermediate difficulty</td>
<td>Guide student to correct answer</td>
<td>Enhance connectedness:</td>
</tr>
<tr>
<td>Too difficult = loss of motivation/self-confidence</td>
<td>Avoid micro-management</td>
<td>Communicate frequently, keep students in the loop; check-ins</td>
</tr>
<tr>
<td>Too easy, little reward</td>
<td>Intermediate management is appropriate; should also be individual-specific</td>
<td>Celebrate success, appreciation</td>
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<td>Lab socials</td>
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<td>Lab retreats</td>
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</table>
The importance of motivation

HOW CAN WE ENHANCE MOTIVATION?

Some other tips

- Match student to ‘right’ project
- Introduce them to colleagues, opportunities to engage
- Foster collaboration
- Make sure they have a clear vision of their research project
- Help them set clear, manageable goals—progress motivates!
- Give constructive feedback, encouragement (individually tailored)
- Ask for their opinion (adds value, increases self-worth)
- Work-life balance (encourage holidays, breaks)
- Expect students to make mistakes

Students that aren’t passionate about their project will struggle with motivation. Pre-covid we could send them to visit collaborators abroad. Students short on confidence need more encouragement and affirmation.

Don’t let students that make mistakes lose confidence. Provide reassurance.
Pulling this together:
Building skills improves competence which builds confidence, which helps motivate = productivity. Give the right amount of autonomy (student-specific) and enhance/foster social connectedness and team work in RG. This is all kind of a circular, self-reinforcing cycle.
Developing a research group philosophy and culture

28 April 2021
I like to ask PhD students what sort of scientist they seem themselves becoming, and to think about what sort of jobs they would be applying for.

I also have a lab manual which would outline this philosophy, so they have it in writing. Seminar attendance. One trick is to couple your meeting with the seminar, so you go as a group. You can also watch an online seminar in lab meetings.

I’ll return to some of this when we talk about lab meetings.
Communicating with, and managing your research group (RG)

Good communication improves levels of engagement and social connectedness. Being organised improves efficiency.
I’ll show you some examples of how I use Slack. Personal vs public channels. Turn off notifications!

I won’t talk about data and shared file management (Dropbox, OneDrive, SharePoint, etc.).
How to manage and communicate with your RG
SLACK, TRELLO/MONDAY.COM, WHATSAPP, GITHUB

WhatsApp
- Useful for field work & quick communication
- For collaborators outside MQ
- Multiple group chats
How to manage and communicate with your RG
SLACK, TRELLO/MONDAY.COM, WHATSAPP, GITHUB

Trello (project management)
• Also can be used for student management, projects/to do lists

https://trello.com/b/1x4Ugl2u/project-management

Good for managing student projects. Can have to do lists for student (and you) and keep track of progress. I got a demonstration from a colleague at ANU that swears by it. But many other packages such as Monday.com and others that are also very effective.
How to manage and communicate with your RG

KEEPING ORGANISED

Data management & shared files
- Dropbox—(RG shared folder)
- OneDrive, Sharepoint
- Google docs
- Github

- Good for keeping track of projects

Have a manual
- Perhaps more useful in STEM
- A working guide on admin, navigating MQ bureaucracy
- Can be maintained on Github (version control) allowing lab members to update.

I have a shared folder in Dropbox for everyone in my RG.
# How to manage and communicate with your RG

## RESEARCH PORTFOLIOS

### Benefits
- You can’t do it all
- Gives members responsibility
- Enhances group cohesion/sense of belonging

### Challenges
- Tough to do with a few students (still give them a responsibility)

### Examples of portfolios
- Journal/reading club
- Social director
- Outreach/education
- RG meetings (‘thing of the week’, etc.)
- Web page (in some circumstances)
The art of effective research group meetings

28 April 2021
The art of research group meetings

PHILOSOPHY AND AIMS OF RG MEETINGS

Aims and what lab meetings provide
- Reinforce RG culture & philosophy: be a scholar—think critically, deeply, and learn from your peers
- Develop communication skills, develop intellectually
- Be stimulating
- Promotes interaction, engagement, strengthen bonds, identity (team work)
- Help students understand the inner workings of academia and science/industry/commerce/the arts
- Ensure smooth running of the RG and research.

This links back to developing a RG culture and philosophy. Talk about what is going on in the university more broadly and help them understand how academia works.
The art of research group meetings

FREQUENCY AND STRUCTURE OF MEETINGS

Frequency
- Weekly if possible (lunch time works well)

Structure
Open with non-scientific talk, general catch-ups, ask about people not present

I. Personal progress updates (alternate meetings for large groups)
II. Lab business
III. Talking science/research: proposed experiment/study, preliminary results, pitch ideas, grants
IV. Bring a paper or graph (vs journal club—*the problem with journal clubs*)
V. Themes

Have a locked in day and time.
Bring a paper. Even if you have not read it. You can talk about why it caught your eye if you have yet to read it. If you read it, or part of it, talk about it as much as you like. Load it in the Slack PDF channel reading list by subject. One variation of this is to find a classic paper in your field and say why you picked it.

Journal club can either be separate from lab meetings or part of lab meetings.
The art of research group meetings

STRUCTURE OF LAB MEETINGS

v. Themes

i. Time management, organizing and planning research
ii. Finding a PhD/postdoc/private sector/industry job
iii. Publishing strategies
iv. Writing grants and where to apply (Slack channel)
v. Open science and data management (version control, logging scripts)
vi. Pre-registering
vii. Preprints
The art of research group meetings

STRUCTURE OF LAB MEETINGS

Themes

viii. Developing a research profile: philosophy
ix. Establishing a research profile: Twitter, web page, ResearchGate, Google Scholar, Scopus and Researcher ID, ORCID
x. What is your reading and literature strategy? Scopus? Do you do blue sky reading?
xi. Books to read for your PhD/MRes. What book do you need to read before you graduate? Think about being proficient in a discipline.

xii. Bring along a recent figure to share with the group, or even a favourite figure from an old paper. Even if we have read your paper, we won’t remember the figure! This is just about talking science. Works really well in Zoom meetings.

xiii. Classic papers. Get one or two people to bring along a classic paper from their field, that they have been influenced by. They can simply talk about it or give some sort of presentation where they share figures or other info.

xiv. Animal/concept/artefact/poem of the week. Different person each week.
The art of research group meetings

STRUCTURE OF LAB MEETINGS

Tips

- Let your group know the plans for each meeting several days in advance
- Keep it fun and start by talking about other things—ask questions to encourage chatting
- Keep mixing it up, try different things
- Work in cycles—return to important themes, especially with new group members
- Zoom—invite guests, including students, to give short talks
The art of research group meetings

WHAT YOU CAN DO IF YOUR LAB HAS ONLY A FEW STUDENTS?

- Joint meetings with other groups (pros and cons)
- The ‘coffee club’ initiative—student driven ‘meet-ups’ with closely related research groups
- Make meetings less formal (e.g. over coffee or lunch)
- Make it more tailored to the individual—but still do many of the theme ideas above
- Include enthusiastic/promising undergrads
- Use it to catch up on online seminars (keep a list of seminars you missed)

In ‘coffee club’ they explain their research to other students.
Final thoughts and discussion

- It takes time to build a research group and get the right culture
- Try and be selective about who you take on, if you have that luxury
- You can’t do it all yourself
Resources

LINKS AND REFERENCES FOR RUNNING A RESEARCH GROUP

- Useful blurb on lab culture and running a lab: https://depacem.med.harvard.edu/?page_id=408 NB: see the great resources at the bottom of this page! Including links to Twitter right at bottom.
- Labmosphere: a website dedicated to promoting emotional well-being, mental health, and overall life satisfaction in the area of academic sciences. https://labmosphere.com/
- What to do in lab meetings: https://dynamicecology.wordpress.com/2014/01/15/what-to-do-at-lab-meetings/
- https://hbr.org/2011/05/the-power-of-smell-wins#
- https://selfdeterminationtheory.org/theory/
- https://www.scientifica.uk.com/neurowire/lab-management-10-tips-for-motivating-your-research-group