

## Avoiding pitfalls in interdisciplinary education

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### Original Survey

Section I					
Personal Information					
1. Choose a 4-digit PIN. When uploading this file, please change the file name to "SelfEval_Pin.xlsx", replacing Pin with your chosen 4-Digit number.					
2. Gender: Please mark "X" for Male or Female	Male:	Female:			
3. PhD or Post doc:	PhD:	Post doc:			
4. How much of the NorMER program have you completed? Please mark an "x"	Beginning	1/4	1/2	3/4	Finished
5. Please mark an "x" in the box to rate the following:	No 1	2	Maybe 3	4	Yes 5
a. Was interdisciplinarity important to you when applying for the position? (1-5)					
b. Is your PhD/postdoc as it stands, interdisciplinary?					
c. Do you wish it was more interdisciplinary?					
d. Do you wish it was less?					
e. Have you previously worked on interdisciplinary projects?					
f. Do you plan to work on interdisciplinary projects in the future?					
6. Write the fields that your PhD/Post-Doc spans. (Only write 1 if it is disciplinary). Then please bold your main discipline (i.e. the one for which you already had the most experience before your NorMER term. This is perhaps different than your current department if you switched field).					

## Section II

### Evaluate how well NorMER experiences have enabled interdisciplinary learning.

Please think of concrete examples from your NorMER experience as you mark "x" for the following questions. Your "NorMER experience" can include any aspect of NorMER: your home PhD program, interactions with your PhD advisor or co-supervisors, conferences, workshops, courses, independent projects, etc. To do this, we draw on these 4 themes of interdisciplinary learning (from Manathunga et al. 2007, citing Lattuca, 2002).

7. Within your NorMER experience, was there the need and opportunity to:	No 1	2	Maybe 3	4	Yes 5
<b>a. Talk</b> – talk with scientists or students within the specific disciplines you listed above, excluding your main discipline?					
<b>b. Engage</b> – engage new methods, ideas, or read texts within the specific disciplines you list above, excluding your main discipline?					
<b>c. Synthesise</b> – Synthesise disciplinary knowledge to produce original methods, creative ideas, or criticisms of methods / ideas stemming from single disciplines?					
<b>d. Communicate</b> – communicate complex ideas from within the specific disciplines you list above, excluding your main discipline, to people within your main discipline, or vice versa.					

## Section III

### Evaluate the tools NorMER used to achieve learning themes.

8. Of the time you spent participating in the following aspects of NorMER, how much of that time encouraged any combination of the learning processes above? Please think carefully about this: even if you spent lots of time on an activity, but it did not contribute much to learning via the above 4 skills, then should mark "Little" If you spent 0 time participating in the activity, please mark an "x" in the NA column. In the next set of boxes "To which learning theme is applicable?", please mark which of the 4 learning themes these tools contributed to (more than 1 answer is ok).

	To which learning theme was applicable?										N/A
	Little				A lot	A	B	C	D		
	1	2	3	4	5	"Talk"	"Engage"	"Synthesize"	"Communicate"		
<b>a.</b> NorMER required courses											
<b>b.</b> 4 month placements with co-supervisors											
<b>c.</b> NorMER annual meetings											
<b>d.</b> NorMER funding for conferences / research visits											
<b>e.</b> Young researcher meetings and self-directed workshops											

f. Mainly electronic collaborations										
g. Individual self-direction (e.g. reading books, seeking out students or professors)										
h. Supervisor direction at your home institution										
i. Coursework or other opportunities at your home institution										

**Section IV. Evaluate your dissertation / NorMER publications.**

9. Here we draw from some of the criteria used to judge interdisciplinary PhDs from Mitchell & Willets (2009). Please mark an “x” under yes or No.

	No 1	2	Maybe 3	4	Yes 5
a. Is part of the originality of your work reflected in knowledge, ideas, or methods integrated from another discipline?					
b. Was it especially necessary &/or difficult to justify main arguments or hypotheses when writing because you were synthesising ideas from more than one discipline?					
c. Similarly, was it especially necessary &/or difficult to explain assumptions, choices, research designs, or interpretations of results because you were synthesising ideas from more than one discipline?					
d. Does your research point out flaws or ambiguities on a topic in one discipline that you found because of your broad awareness within other disciplines?					
e. Similarly, did you find that your own methods / ideas may have been flawed or ambiguous through a broad awareness gained from learning other disciplines? That is, did a broader knowledge of other disciplines make you more self-aware of problems within your own research or discipline?					
f. While writing, have you found the need to avoid jargon or explain basic concepts stemming from one discipline, because your audience may be broader than a single discipline?					
g. Of your NorMER publications published or planned, were or will any be published in journal of field outside your main discipline, or in interdisciplinary or applied-topic journals (e.g. climatic change).					
h. Did you have or will you have publications in single-discipline journals or broad-topic journals (e.g. Science or PNAS) that are nevertheless interdisciplinary?					
i. Did you gain any other interdisciplinary outputs as a result of your NorMER experience (e.g. grant applications					

or new collaborations)?					
<b>j.</b> Do you feel that your publications or thesis would have been improved if you had more of the qualities listed in a-f? (The alternative, no, is that is your dissertation is well-supported and explained as is, no need for a broader context.					
<b>k.</b> Taking a-i as rough indicators of interdisciplinarity, is your PhD/postdoc, as it stands, interdisciplinary?					
<b>l.</b> Do you think your understanding of interdisciplinarity has improved during your NorMER experience?					

**Section V. Skills improved during NorMER experience**

**10.** Have any of the following skills *improved* due to your NorMER experience (not whether you have them)? (Spelt et al. 2009, Mitchell & Willets 2009).

Please indicate with “x” whether you believe these skills have increased your ability to conduct:

- 1) Independent disciplinary research in the future.
  - 2) Especially *interdisciplinary* research in the future, above and beyond independent disciplinary research.
- Both options may be marked.

						Increased ability to conduct research:	
	No 1	2	Maybe 3	4	Yes 5	1 Disciplinary	2 Beyond Disciplinary
<b>a.</b> Leadership skills.							
<b>b.</b> Collaborative skills.							
<b>c.</b> Communication with same-discipline colleagues.							
<b>d.</b> Communication with other discipline colleagues.							
<b>e.</b> Communication with non-scientists.							
<b>f.</b> Knowledge of interdisciplinarity.							
<b>g.</b> Critical evaluation of disciplinarily.							
<b>h.</b> Integration of different types of knowledge.							
<b>i.</b> Ability to balance disciplinarily vs. interdisciplinarity in research.							
<b>j.</b> Ability to change disciplinary glasses to evaluate own work from another’s perspective.							
<b>k.</b> Respect of colleagues (colleagues respect you more)							
<b>l.</b> Openness to criticism from colleagues							
<b>m.</b> Trust of colleagues (colleagues trust you more)							
<b>n.</b> Ability to capitalise on strengths of colleagues							
<b>o.</b> Ability to resolve conflicts among colleagues (including yourself)							
<b>p.</b> Curiosity							
<b>q.</b> Patience							

r. Diligence							
s. Self-regulation							
<b>Section VI. Comments</b>							
<b>11.</b> Considering our main goal for self-evaluating NorMER, do you feel that any part of this survey was unfair or misleading? If so, which parts?							
<b>12.</b> Can you think of any better questions for evaluating our goal?							
<b>13.</b> If you were to repeat your NorMER experience, what would you:							
a. Do differently yourself?							
b. Tell your supervisor / management to do differently via anonymous telepathy?							
<b>14.</b> Be honest, did you skip ahead or change previous answers after reading later sections? (Remember at least 2 of the main authors who wrote this survey will need to write “yes”).							

**Survey specifics:**

No. of NorMER participants: 25

Response rate: 88%

List of main disciplines: Biology, community ecology, ecological modelling, ecology, economics, environmental and resource economics, fish population genetics, fisheries science, marine biology, marine ecology, mathematical modelling, physical oceanography, quantitative marine ecology, rural sociology, maritime sociology, natural resource management, social science, bioeconomics, evolution, fish physiology, functional ecology, experimental biology, mathematics, policy, sociology, spatial statistics, and sustainability science.

Male & female ratio: 50:50

No. of PhD's and Postdocs: 14 & 8 respectively

Stage of PhD/PostDoc: 1 at 50%, 9 at 75%, 12 at 100%.