8

Students' supervision and introduction during the initial period in the research laboratory: does it matter?

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Summary

This project reflects on my own experiences and development period covering the last three years of Master student introduction to and supervision at the Department of Biomedical Sciences at UCPH. It consists of Problem statement, questionnaire design covering introduction and the follow up with students, analysis of responses and a discussion of the results and possible adjustments in order to improve the initial period of integration to a new professional environment.

Introduction and problem statement

My project concerns evaluation of the very first steps of introducing new Master students to the working environment of the research laboratory. Typically, those students spend ten months working in the laboratory to generate scientific data and write up their master thesis project. However this ten months are actually the first time (in most cases) where students are working in the professional environment directly linked to their study subjects and thus represent their first 'real' job, the first time where they can evaluate their aspirations, plans and directions they set up themselves for by selecting a given study profile at the university. This in turn gives an importance to the initial introduction and early follow up of those students in the new laboratory setting. The way they are welcomed and placed within the

working group, the way they are supported, mentored and navigate may be critical for their decisions impacting career paths and jobs they will decide to undertake after the completion of this period.

Much emphasis has been put on a classical teaching which I understand here as lectures or classroom teaching. However, my daily responsibilities and functions as a young teacher-researcher are, as mentioned before, defined by the supervision of Bachelor, Master and PhD students. Within that supervision, important phases can be defined as: introduction to the new environment and responsibilities, settlement where the most of the project related activities occur and closing where writing up the project and defending it takes place. Introduction to a well-functioning, close-knit group can be difficult particularly for people with limited experience working in professional environments. It can be compared to a stressful situation where one was getting a job without required qualifications to fulfill it. Nevertheless, codified procedures of such introductions and early follow-ups are scarce within universities and relay mostly on person-to-person interactions between the student and its daily supervisor. The existing procedures focus on providing optimal feedback mostly in the context of professional growth: experimental design, practical advice, data analysis and ability to write and present the results. They leave open the more 'wholesome' approach to a student that undergoes critical transformation into professional life.

Our own laboratory has prepared a general 'admission file' which we use during our students introduction. This is given to students and discussed with them during the first meeting. However, it contains mainly practical information covering laboratory and safety rules, necessary steps to be taken to integrate to the work place like access cards, email set up, working station and office space. This document is not backed by more descriptive one, normally to be used by supervisors, that would touch on students expectations, professional plans or even personal limitations that may be vital during the initial transition period. My discussions with peer supervisors from Panum Institute describe very similar situation in all the laboratories, with some having no formal introduction to the new work place at all.

With this particular focus and approach, I believe this pedagogy project can contribute to the overall debate on the importance of the way we introduce young people to the new environment and extent of the support we, as supervisors, offer for them in their final stages of academic education.

Hypothesis

I hypothesize that well organized introduction and critical subsequent follow up within the first 1-2 months of a student project has a positive impact on:

1. Life altering choices (future career planning)
2. Performance within the project

Objective

The main objective of this pedagogy project is to assess students' early experiences within the new working environment in order to draw relevant lessons and point out limitations and possible adjustments to the processes covering initial time in a new working environment.

Methodology

A group of students that have spent at least 6 months of their studies working on the research project in the laboratory of Immunoendocrinology Section at the Department of Biomedical Sciences was asked to respond to a questionnaire concerning their supervision, introduction and follow up during their respective research projects. The students were asked to answer Yes or No and possibly provide more expanded comment on their answers. Six our former students participated in the project.

Results

This section will give an overview of provided answers. A total of 6 students were asked to fill in the questionnaire and all responded. The following questions were asked:

1. Do you think that the way in which new students are introduced into the research laboratory is important for them and research group?

All students responded Yes to the question. This may not be surprising as it follows a general expectation that a good introduction represents a 'good first impression' generated between two people or groups of people and is somewhat representative for a broader cultural background (Carlston, 2013). However, it exemplifies also a recognized need for help in transitioning to, in most cases, a completely alien milieu. Almost all students responded along similar lines: *'Because it is always important to feel welcomed so you can have a great start.'*, *'Because it makes it clear for everybody what is expected to be done'*, *'Because it is very important to teach new students good manners and habits in the lab','It's important both socially (get to know lab members = good working atmosphere'*, *'Because first impressions are very important'* and *'The right introduction also makes for good socializing where you e.g. can enjoy lunch together, making the workplace more enjoyable and fun for everyone'*.

However, they also recognized other important aspects of the impact, that introduction can have. That covers their adaptation to new responsibilities towards a new working environment, clearly indicating that they recognize their own professional responsibilities. Good introduction *'is also an advantage for the research team, because the newcomer faster becomes an asset rather than a liability'*, is important *'scientifically (good intro to the lab and techniques = higher quality of output, less risk of mistakes, contaminations and accidents)'*.

Interestingly, students, although only two of them, recognized that the way they are introduced can impact their own professional future *'because in many cases it is an undergraduate student's first research experience so it helps them to reduce stress and tension as well as become familiar with lab routine, procedure, etc.'*and *'it will serve both the student and the lab many fold in the long run'*.

All three covered areas point to student expectations and good understanding that this is their first and important step towards becoming a professional work force. They are open, eager and clearly expect a warm and precise introduction. For them the whole world is changing, new opportunities are present and they want to use and contribute to them.

2. Do you think that such an introduction can have an impact for the future career planning?

Here, again, all students agreed and answered Yes. Derived from the first question, it gave students an opportunity to elaborate more about the future consequences of the way their first *'job'* started and modulated their

attitudes. The majority of answers was similar to the following one: *'It can determine someone's view on the field – positive or negative'* and *'it could easily shape their attitude and what to expect from a career in research and how research can vary'*.

They also recognized the broader importance of a good working environment by stating: *'If you do not have anyone to talk to in the place you have to go every single day, you will not stay for long, even if they have the perfect job for you with the perfect salary'* and an impact it may have on their own path: *'it is a great way to get people more involved and more interested in a future career'*.

3. Do you think that such an introduction can have an impact on your yearlong project success?

With this question it was possible to asses a more direct role of an introduction on the students' project itself. Do they think that they can cope for some time with a not perfect work place and still succeed in their master project, apart from the impact on much longer professional choices? Much shorter perspective brought a slightly divergent opinion. While some of the students, probably coming off the first two questions, still strongly valued good introduction: *'I think introduction will bring you closer to your goals and makes many things clear as well as make you interested in the field of research.','Since efficient approaches in our line of work are essential for experiment execution and ultimately project completion I think it is extremely important.'* and *'A good introduction may help eliminate (sometimes silly) mistakes and accidents, which can lead to better quality research in a shorter amount of time,* others felt much more secure about their ability to complete their tasks independently of the conditions: *'A year is long enough time to figure things out even without a proper introduction'*. Possible interpretation of such answers may lay in the fact that we tend to expect a positive conclusion of our short term tasks (self-enhancement (Ferris, Johnson, & Sedikides, 2017)) as they represent something we can easily envision and thus gives us an impression of stronger dependence to our own aptitudes.

4. What do you remember from your own introduction to the Immunoendocrinology Lab?

I wanted to analyze the quality of introduction into our laboratory of its new members and see if their opinions (good or bad) correlate with their decisions to follow a PhD program or other professional choices.

All students indicated that the introduction process was good and friendly: *'I remember everyone being very welcoming towards me. I remember feeling part of a group very fast, given responsibility, people caring and listing to what I had to say.'* and *'I was welcomed warmly in the group.'* Importantly, practical elements of introduction were also well taken care of: I got *'a list of stuff to remember to do or where things can be found, because it is very easy to forget when you get a lot of information at once.'*, *'It was a great feeling that the head of department walk with me around the lab and show the devices, instruments, guidelines etc. I had a doubt about choosing the project but with his introduction I had a feeling that "I can stay for certain"* and *'I was given increasing responsibility throughout my project progression, I was taught multiple biological and biochemical methods, and allowed time and space to try to combat any issues on my own. A valuable lesson. I was giving the tools to resolve problems.'* Additionally, students were assured that this is a learning period, that they will encounter difficulties and make errors but they will be supported at every step. The goal was set up clearly, to learn, get better, write a good thesis and be more prepared for the next professional steps, whatever they will be for them: *'I was told: "you will make mistakes, break stuff, and ruin long and expensive experiments. But that's ok. Don't panic. We are all here to learn." For me, that was the best thing to hear because it removed all the stress and anxiety of working in the lab. Also, "the mistakes are not mistakes if you can learn from them" put things in a different perspective.'*

The introduction in the Immunoendocrinology Lab has been developed over the years from scratch. With every new student we aimed at improving it through collecting students' feedback early on as well as at the completion of their project. In the beginning we decided that there are certain general aspects that each student needs to be taught but at the same time we always remember that the approach has to be individualized. That it needs to take into account students background (many of them are not Danish and no one was originally born on Copenhagen), their possible limitations (often they have additional jobs) and critically their post-Master thesis plans. Students were always asked about the PhD plans and informed that if they decide so, and with consultation with us (professor and assistant professor) we would set up plans for writing up PhD applications. In case they did not plan to follow academic career we would modify they project so that they can learn techniques and approaches suitable for their professional choices (most often pharmaceutical companies). At the same time we made sure

students will meet all the Master thesis expectations put by the University. Majority of them defended their thesis with a mark of 12.

5. Do you think that a subsequent follow up meetings play an important role in adjusting your expectations and specifying future plans?

Introduction is a first step. Then reality settles and first follow up meetings are focused on helping students not only adjust better but to answer new questions they may have after spending about a month in the lab. And not surprisingly, all students responded Yes providing following extended answers: *'MSc students might have an idea for future plans at the beginning but in most cases it changes along the way, when they get familiar with independent lab work'*, *'I think it is important for the student to have follow up meetings to adjust these things as it, very commonly in science, goes a different way that you thought in the beginning.'* and *'many questions do not pop into your head until after the (first) meeting is over, so it is nice to have a second one where you can ask those questions.'*

Three out of six students saw value in follow up meetings in the context of a longer perspective. They understood that first weeks in the lab could have been critical for them, or have been (*'Because time offers perspective'* and *'it is possible to evaluate weakness and strengths'*) and thus wanted specific information *'whether there is a possibility of continuation of the project in question'* as a PhD or if similar projects can be found outside of academia. They evidently developed a much more precise expectations and gain insights into what can come next when they finish their current assignment. At the same time, as more informed individuals, they welcomed another discussion about the projects and consequences of the decisions they were making.

The two following questions attempted to put in the perspective (from previous questions) the students plans and their outcomes.

6. Did you want to become PhD student after your MSc?

Four students indicated their interest in following a PhD path while two decided to look for the job outside of academia, even before the Master project initiation. In the follow up question:

7. Did you become PhD student after your MS?

Two students started their PhD while four others not. Two, currently PhD students, provided follow up explanations: *'Because it is a great way to stay in cutting-edge research in the lab. Also I was very happy with the*

group members as well as my master's project.' and *'I like how research is ever changing, plus the freedom to pursue research ideas in academia. It was the logical way to go if I want to pursue an academic career. I really wanted to continue my project, and I eventually got the funding to do so.'* Those answers were consistent with the initial plans, well received introduction to the lab and subsequent follow up. The paths of remaining four students were more complicated. Two of them were unable so far to launch their PhDs and answered: *'I'm considering it. I want to do research on my own project. I think PhD research will help to improve my abilities to understand and solve problems, increase confidence, make me a better communicator and gain skills that may lead to a better job, even in many fields apart from academics.'* and *'I am applying for it. Apart from qualifications, networking plays an important role in Denmark. So, I guess it could be challenging to find a good project, however, I try my best for expanding my future career.'* This clearly indicates that they would accept or are actively searching for PhD opportunities but for different reasons are unable to find their place and founding.

The remaining two students that did not want to become PhDs and the time in the lab did not change their position, answered along the following line: *'I want to have a "regular" job where I don't need to think about work when I come home, which I believe writing a PhD might.'* But importantly none of them reported that the period spend in our laboratory had a negative impact on their plans. They all seem to be supported in the choices they made and had been given the opportunity to experience by themselves how difficult but fascinating the research is. However again, in my survey I have not encountered students that estimated their introduction to the lab as insufficient or negative and thus I cannot evaluate if such a 'bad' introduction has really a negative impact on students' professional choices.

References

Carlston, D. E. (2013). *The oxford handbook of social cognition*. Oxford University Press.

Ferris, D. L., Johnson, R. E., & Sedikides, C. (2017). *The self at work: fundamental theory and research*. Routledge.