# AM I DOING ENOUGH FOR MY SCIENTIFIC CAREER?

By Sven Hendrix

Many young scientists fear that they are not investing enough in their scientific career, however, it is often not clear what exactly they should do and how important different aspects are such as publications, grants, teaching, mobility, technical skills and just being a good scientist. Find some directions and a checklist here.

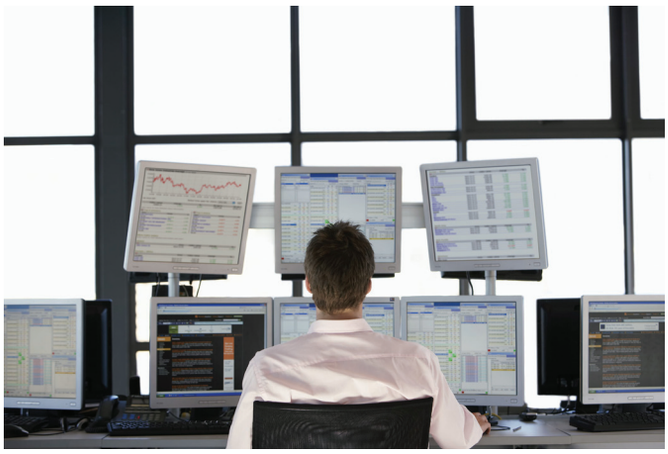
## Did I reflect enough on my career?

This is without doubt the most important question to develop a healthy career strategy. Below you find a number of questions which help you to analyse whether you have done enough in several key areas which are important for a career in science. If you have no clue whether you want an academic career or leave academia go to the last point "What do I want?" for an effective strategy to find out.

***Key question:*** *Did I reflect on my career and write down a career plan?*

## Did I generate enough data?

**To write fantastic papers you need to generate lots and lots of excellent data.** What are excellent data? "Excellent" is – no surprise – a very subjective term. Key characteristics are that they are conform with the state of the art and with all rules of scientific integrity. However, negative results are mostly not perceived as excellent results – even when they are performed with perfection. **Read more here:** Should I publish negative results or does this ruin my career in science?



If your aim is to produce high impact publications be prepared to work a lot in order to produce a lot of data. To get a rough idea how many figures you need for a high class paper download a few publications in your target journals (let's say Nature or Science) and count the number of figures and supplementary figures. Then analyse how many different methods are used per figure. **Normally, the higher the impact, the more alternative methods have been used.** This is not true in all areas of science but a good rule of thumb in life sciences. This makes a lot of sense because every method has advantages and disadvantages and the more methods you use to address the same question from different angles, the more convincing your results are.

***Key questions:*** *Did I do enough experiments to generate enough figures for my target journals? Did I address my scientific questions from different angles by using several different techniques/methods?*

**Find some inspiration here:** 10 simple strategies to increase the impact factor of your publication

## Did I publish enough? Did I publish well enough?

For an academic career there are a few simple rules which make your life much easier (at least in life sciences and similar domains): With a very few exceptions it is always better to **publish with a high impact factor instead of publishing a high number of papers with much lower impact factors**. For a non-academic career it is useful to demonstrate your expertise and stamina but you have to avoid to be perceived as being lost in the "ivory tower" of academic research.

Publishing is a complex process which includes designing a good project, generating enough interesting data and writing a compelling story to summarize and interpret your data. **The most important skill is to get and integrate feedback for your writing** from experienced scientists who have published excellent papers in the previous years. You should definitely follow classes on scientific writing. It is also useful to get your papers edited by a competent person – especially if English is not your native language.

To make this true you should make it a habit and schedule a certain time per week – for example every Friday morning. Only if it is in your agenda you will do it.

***Key questions:*** *Did I invest enough time and effort in writing my publications? Did I schedule it? Did I ask for enough feedback to improve my writing skills? Did I participate in classes/courses to improve my writing skills? Did I get feedback on my English (grammar and style)?*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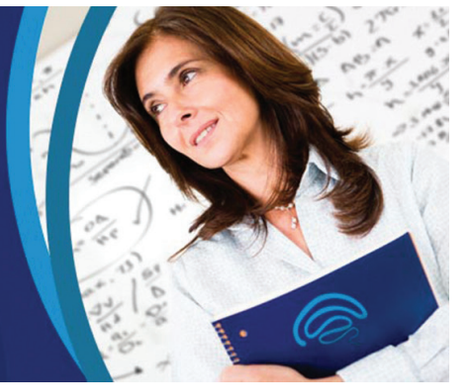

**Read more here:**

- » What is the best publishing strategy in science?
- » 10 simple strategies to increase the impact factor of your publication
- » Do I need Nature or Science papers for a successful career in science?
- » Should I aim for multiple co-authorships to extend my publication?
- » Should I aim for co-authorships on high impact papers?

## Did I raise enough funding?

If you want an academic career (= become a professor) you must learn to raise grant money. The more money you raise the more attractive you are as a candidate for new positions. Without doubt this skill also makes you more attractive for industry positions. Thus, investing a substantial amount of your time in grant proposal writing is crucial.

## Did I invest enough time and effort in grant proposal writing?

In the beginning of your career (late phase PhD and postdoc) I would suggest to invest at least 25% of your time in grant proposal writing. Similar to writing your papers you should make it a habit and reserve some time of your week for writing grant proposals. Only if it is in your agenda you will do it.

***Key questions:*** *Did I invest enough time and effort in grant proposal writing? How much time do I want to invest? Did I schedule it?*

However, it is easy to waste your time when you write proposals without proper feedback.

## Did I learn to write excellent grant proposals?

In order to develop grant writing skills you need lots of feedback from experienced grant writers and members of grant selection committees. **The feedback you get from funding bodies can be misleading** because the comments may be "cleaned up" to avoid legal actions by the applicants. It is more efficient to give your grant proposal to an experienced and successful colleague who has been part of selection committees and ask for thorough feedback. This will improve your grant writing skills dramatically because your expectations how selection committees work are probably wrong.

***Key question:*** *Did I invest enough effort and time in getting feedback for my grant proposals?*

## Did I write enough grant proposals?

**Raising grant money has elements of expertise, persistence and luck.** If you have learned the basic skills how to write a proposal, if you have received enough constructive criticism and learned from it, the next step is to develop persistence. You have to **make it a habit** to write grant proposals on a regular basis and **optimize the process:** You can recycle parts of old grant proposals (for example the introduction and the materials + methods sections). You can resubmit an optimized proposal. You can divide the work with co-applicants.

**Key questions:** *Did I write grant proposals on a regular basis? Did I optimize the process?*

**Read more here about funding:** Funding – Should I submit grant proposals under my supervisor's name?

## Did I learn enough technical skills?

Independent of your career goals it is a good rule of thumb to **learn at least three different techniques by heart**. If you know only one technique (e. g. immunohistochemistry) you appear one-dimensional and other candidates may be preferred. Become an expert in applying the techniques and especially in trouble shooting. Try to be divers and select at least one fancy techniques which is not a standard technique used by nearly everybody. Being an expert in 3 techniques makes you a valuable lab member, gives you a lot of positive feedback (especially if you help people with these techniques) and makes you attractive for academic and industry positions which rely on one or all of these techniques.

**Key questions:** *Did I focus on three different technical skills? Did I practice them enough to be a good trouble-shooter? Did I help others with these techniques?*

## Did I learn enough to be an expert in my field?

Becoming an expert seems easy because research is so broad that focussing on one specific field automatically increases your specific expertise. However, to become an expert you have to **know the mile stone papers in your field** and you have to attend scientific meetings to **know the new hot topics before they are published**.

**Key questions:** *In which field am I (or will be) an expert? Do my colleagues know what my expertise is?*

## Did I read enough field-specific literature?

It is good advice to develop a reading plan and a reading habit. You should reserve at least 1h per week to read the mile stone papers in your field and to stay updated on new publications. To find the mile stone papers you should ask your supervisor and senior colleagues in the field. It also helps to read a few major reviews published recently in high impact journals in your field to find out which studies get cited again and again. One very efficient way is to write a review about your subject with your specific perspective.

**Key questions:** *Do I know the 10 most important publications (and their authors) in my field by heart?*

## Did I write enough reviews?

Writing reviews has a lot of advantages. You get to know the literature and the names of the most influential scientists in your field. You may be able to publish your review with a high impact factor and you may gain much more visibility in your field.

**Key questions:** *Did I write every year a high-class review in my field with my specific perspective? Do I have a writing plan?*

## Did I teach enough?

The value of teaching for your career depends a lot on your career goals (see below "What do I want?"). If you are planning a career in teaching you may use your time to get to know all modern teaching strategies, teaching tools such as smart boards,


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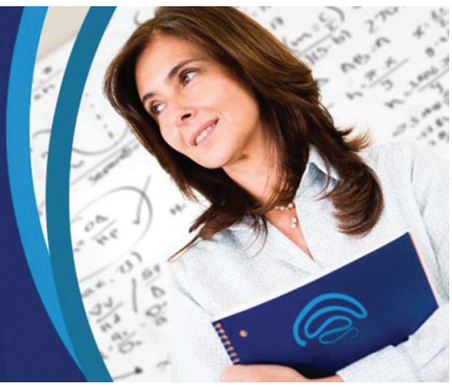

online communication systems such as Blackboard and curriculum development. For an industry career teaching normally is only a nice add-on, however, you can sell it as people skills which are always an advantage. For an academic career teaching has a certain value but take care not to overestimate the value of teaching experience compared to other key areas which are important to make you an attractive candidate.

**Key questions:** *Do I know how important (or not) teaching is for my future career? Did I follow courses on teaching? Do I know at least one modern teaching tool?*

**Read more here:** Is teaching expertise really necessary for an academic career?

## Was I mobile enough?

There are many good reasons to go abroad but also a lot of difficulties to handle. Briefly, when you pursue an academic career (= becoming a professor) you are nearly obliged to work abroad. There are professors who never left their country for more than a few weeks (for vacation!) but the huge majority has substantial international experiences. For any other job international experiences are always a plus because you broaden your horizon, get more mature and better organized. How long should you go? The longer, the better. If your international experience is limited to a few weeks or months it will be considered to be rather a vacation than an international experience.

As a rule of thumb I would suggest to live abroad for 1 to 3 years. One year is a very short period to produce any substantial output. If you stay away for much longer, potential employers may wonder whether you are really motivated to come back. A good move may be to do a 4-year PhD or a 3-4 year postdoc in another country.

**Read more here:**

» Do I really have to work abroad as a scientist?

» 9 reasons not to go abroad – and how to handle them!

» Should I organize a short stay abroad during my PhD?

## Did I have enough industry exposure?

Independent of your career goals (see below "What do I want?") industry exposure is important for a number of reasons. Firstly, you **learn the difference between academic thinking (publish or perish, raising grant money) and industry thinking (producing a product and revenue)**. Secondly, you broaden your horizon and **see more career possibilities**. Thirdly, you **make a lot of contacts** which may either open the door to an industry career or lucrative academia-industry collaborations in later stages of your career.

***Key questions:*** *Did I get in contact with colleagues who work(ed) in the industry sector to ask about their experiences? Did I work in the industry sector or did I work together with industry partners?*

**Read more here:**

» Why professors do not train you for the non-academic job market – and how to handle it!

» Should I become a professor? Success rate 3 % !

## Do I have enough national and international connections?

As mentioned above contacts and connections are important to build a network which may help you to find a future job or productive collaborations. You may **collaborate with international**

**colleagues** who are experts in their field and may contribute technology and expertise to your papers (or the other way round). It also increases your national and international visibility. Especially for academic careers this is important to develop and demonstrate scientific independence.

***Key questions:*** *Do I have a plan to build connections and my network? Do I search for national and international collaboration partners?*

**Read more here:**

» Scientific independence – how to develop and demonstrate it?

» Do I really have to work abroad as a scientist?

## Did I participate in enough academic committees?

Young scientists (especially female) are often invited to participate in the academic administration. Such as being a member in biosafety or ethical committees, selection committees (technicians, PhD students) or reviewer committees for bachelor or master theses. Postdocs can waste a lot of their time on committees without ever seeing a convincing return of investment. Therefore, these activities should be carefully selected to avoid a negative impact on more relevant activities (generating data, publishing high and raising grant money).

***Key questions:*** *Did I participate in committees to learn how they work? Did I waste a lot of time in useless committee meetings?*

**Read more here:** Disadvantages of gender policy for the career of female scientists.

## What do I want?

Most young scientists do not have a clue what they should do after finishing their PhD. Many continue as postdocs because they like research and simply have no better idea. Even postdocs often have no precise idea whether they want to stay in academia or find a job in the industry sector, public policy, politics, NGOs etc.

***Key question:*** *Am I clear enough about my career goals? If not – did I invest enough time and effort in defining my career goals?*

## How to find out?

Most career books, course and seminars I have seen in the last 20 years start with the question "What do you want from your career?" followed by **personality tests** like the Big 5 or Strengthfinder. These tests help you to describe you personality better – at the moment you take the test. **Do personality tests help you to define your career goals? Normally not**. The next advice is to **investigate your passions**. However, whenever I ask a big group of young scientists "Who knows what his/her passion are?" only 1 or 2 persons show their hand while 99% of the others have no clue what their passions are. **Does analysing your passions help you to define your career goals? Normally not.** Most people discover their passions during a long journey which includes multiple pleasant and unpleasant experiences in many different contexts which finally give them some


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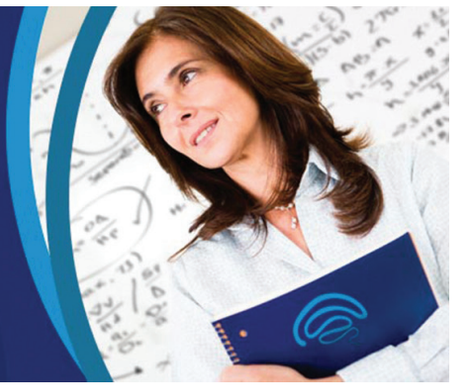
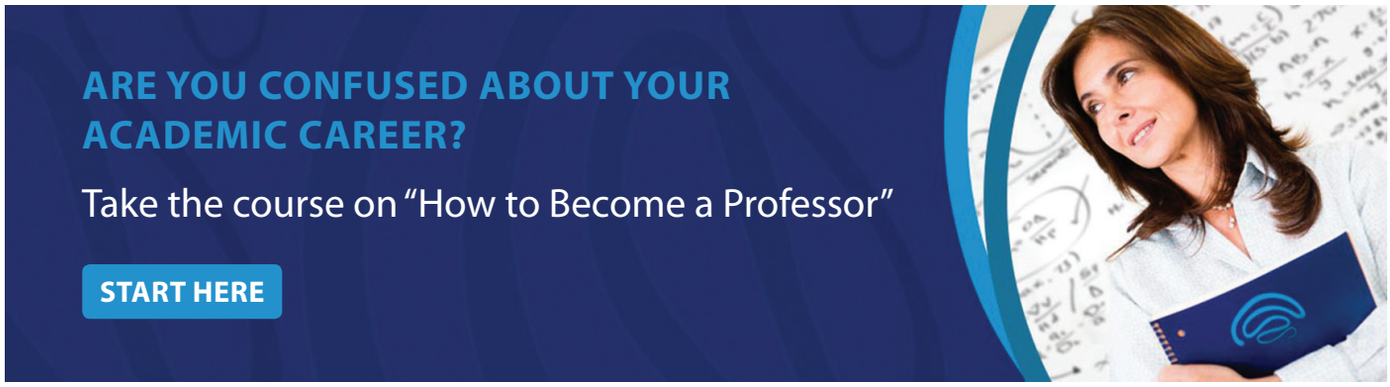


idea what they like and dislike. **Many activities I enjoy most today I did not know of when I was 20 years old.** I had to get to know new contexts, learn new skills, make lots of mistakes to learn from. In addition, I enjoyed some great successes and victories and experienced epic fails.

## Did I search for enough information about 5 potential careers?

The best strategy to identify your ideal career(s) I found is design thinking – briefly: Try on a few "hats" and look what fits best. To do that you have to **make a list of 5 potential careers and contact at least 3 to 5 people who can give you expert advice** on these careers.

***Key question:*** *Did I explore at least 5 different potential careers via Google? Did I contact and chat with at least 3-5 persons per career to get more background information over this career path?*

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