

# How to become a (full) professor before you turn 40?

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## Abstract

In Norway, where all associate professors (“førsteamanuensis”) who are qualified as a (full) professor are offered a personal professorship, it is no other than the associate professor him/herself who stands in the way of the Professor title. This article reviews 12 success criteria in order to achieve qualifications as (full) professor: (1) Accept professional challenges, (2) always consider publishing; (3) children should take (a lot of your) time; (4) limit preparations; (5) have fixed supervision time; (6) lecture-less-time = time for research; (7) accept your level of competence; (8) establish an infrastructure for research; (9) leave the demanding honorary posts to (full) professors; (10) stay away from Internet and other time thieves; (11) be persistent; (12) be strategic - not cynical. If you follow these tips the professor title will be yours before age forty.

## 1 Introduction

The title professor is the highest academic title. In Norway, a professor title is protected by law through the University Act § 6-7, which indicates that the term professor can only be used for positions at the highest scientific or artistic level. As a rule of thumb we can say that workload needed to become a professor in Norway, depending on the subject, represents the scientific effort corresponding to 2-3 doctoral degrees.<sup>1</sup> In science, the norm is three doctoral degrees. In some subjects, like medicine, it has been decided that the norm should be 3 doctoral degrees. The University Act specifies that professors should “give higher education, conduct research and disseminate knowledge in the community about scientific methods and results.” Moreover, it states “institutions can not be instructed on the content of teaching and research.”

The road to the title of professor may be both cumbersome and difficult. For some it may take 15-20 years of scientific efforts to achieve the goal. For others, the title is achieved in a few calendar years. There is little doubt that the way for most people can be accelerated with a dash of strategic planning. I became a professor seven years after my MSc studies and two years after the PhD was defended. I am convinced that through a goal-driven effort, it should be possible to achieve a professorship 5-6 years after the PhD was granted, and long time before the person passes the forty.

It is not easy to gain insight into the different tasks that you will face when employed in an academic position. Even more difficult is it to prepare for this life. Professor Thomas H. Corman at Dartmouth College has described this uncertainty as follows:

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<sup>1</sup> Note that the requirements for a doctoral thesis, especially with regard to the volume, can vary from field to field. Often the classic Dr. philos. degree is used as a basis for calculating the volume.

*“What struck me years ago at Dartmouth, and what continues to be true, is how little of what I do as a faculty member was I trained to do in graduate school. In grad school, I learned how to do research (whatever that means), how to write it up, and how to give talks on it. (And I was fortunate to have an advisor who viewed working with students on writing and talk-giving as an integral part of advising.) I was not trained in any aspect of teaching—how to give lectures, how to grade, how to plan a syllabus, how to design exams, etc. I was not taught how to write grant proposals. I was not taught how to do administrative work. I was not taught how to deal with students crying in your office. I was not taught how to deal with male students crying in your office. (The very first crying student I had to deal with was a guy. Awkward!) I was not taught how to hear sexual assault cases on judicial panels. (I have had to do this at Dartmouth.) There's lots of other stuff that I wasn't taught in grad school, but you get the picture.”<sup>2</sup>*

This article will unfortunately not tell you everything Cormen is calling for.<sup>3</sup> What I will tell you is my own success criteria<sup>4</sup> for how to become a (full) professor. These are all based on my own experience. The criteria are as follows:

- 1) Accept the academic challenges ahead.
- 2) Always consider publishing - a work is not finished until the results are published.
- 3) Children should take time! (If you have children you have to accept that scientists without family obligations can work more than you and therefore faster will get to the top.)
- 4) Limit the time for preparation of lectures, preferably only afternoon/evening before they take place (but be prepared for night work).
- 5) Have regular supervision time /appointments with MSc and PhD students.
- 6) Lecture-less-time = time for research. Look at the lecture-free periods as your busiest and most productive research sessions.
- 7) Accept your own skill level – you do not get better by failing to publish your results.
- 8) Establish an infrastructure for research.
- 9) Leave the heaviest honorary posts to the (full) professors (but take your share of joint tasks).
- 10) Stay away from the Internet and other time thieves.
- 11) Be persistent!
- 12) Be strategic – not cynical!

This article will examine these success criteria and discuss them separately. Note that this is not a scientific article in the sense that it is based on observations from a large number of people.

## 2 Success criteria

The introduction listed 12 success criteria for achieving a professor title. These will be dealt with in the coming sections.

### 2.1 Challenges

My first advice is that you should accept the professional challenges that come from the research community. Without documented research in the form of publications, you will never be-

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<sup>2</sup> Comment (added 28.5.2010) on Assoc. prof. Matt Welsh's blog: <http://matt-welsh.blogspot.com/2010/05/secret-lives-of-professors.html> (Last accessed: 17.11.2010.)

<sup>3</sup> If you want to learn more about these issues, you have to follow my PhD-course MNF-8000 Communicating research (Norwegian: “forskning og forskningsformidling”) at University of Tromsø, Norway.)

<sup>4</sup> The criteria were designed in the second half of the 1990s when I was encouraged to give a career talk at the Hedmark University College, where I at the time was an adjunct professor.

come a professor! Do not be afraid to take on new issues – all research areas are subject to continuous development. Note the late professor Roger Needhams words:<sup>5</sup>

*“Today, I cannot tell what I am going to do in five years – the only thing I know is that it will be fun!”*

One of Professor David Patterson's<sup>6</sup> advices for how to have a *bad* career in science is that you should define your own little area of research that is slightly different from the established areas. Then you should stick to the same subject area and become the leading expert there. What one should rather do is to choose an area where the marginal utility is high. I.e., find an area in which you with a reasonable effort can manage to generate new knowledge.

The advantage by throwing yourself on the new trains that pass by could also be that you yourself do not have to get them up in speed, but beware of losing contact with the development in your field of expertise. Ask yourself “What's in it for me?” If the answer is “nothing” – both in short and long term, you should consider to not accepting the offer.

For many, writing research grant applications are very time consuming. If you are invited to join the bandwagon, you will benefit from the work that someone has already done, so you should have compelling reasons to turn down the offer. It is actually harder than you think to obtain funding. Assoc. prof. Matt Walsh has described the pursuit of research funding as follows:

*“The biggest surprise is how much time I have to spend getting funding for my research. Although it varies a lot, I guess that I spent about 40% of my time chasing after funding, either directly (writing grant proposals) or indirectly (visiting companies, giving talks, building relationships). It is a huge investment of time that does not always contribute directly to your research agenda -- just something you have to do to keep the wheels turning. To do systems research you need a lot of funding -- at my peak I've had 8 Ph.D. students, 2 postdocs, and a small army of undergrads all working in my group. Here at Harvard, I don't have any colleagues working directly in my area, so I haven't been able to spread the fundraising load around very much. (Though huge props to Rob and Gu for getting us that \$10M for RoboBees!) These days, funding rates are abysmal: less than 10% for some NSF programs, and the decision on a proposal is often arbitrary. And personally, I stink at writing proposals. I've had around 25 NSF proposals declined and only about 6 funded. My batting average for papers is much, much better. So, I can't let any potential source of funding slip past me.”<sup>7</sup>*

Ideas come to you when you least expect them. Record immediately all ideas that come in your mind, they may not come again. Research is ultimately not about to be the most brilliant researcher, but to be a day before everyone else.

Research is about taking risks – if you both know the solution in advance and you know how to get there, we are talking about development. If you know the solution, but not how to reach it, it is called applied research. If both the solution and the road are unknown, it is called basic research. Anyway, the point of research is to discover previously unknown knowledge.

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<sup>5</sup> Roger Needham (1935-2003) was professor at Computing Laboratory, Cambridge University, UK. The quote is from an invited lecture at University of Tromsø, 1992.

<sup>6</sup> Source: professor David A. Pattersons lecture: “How to Have a Bad Career in Research/Academia.” Presented on “The Computing Research Association Academic Careers Workshop” (Denver, CO, June 4-5, 1997) <http://www.cs.berkeley.edu/~pattsrn/talks/research.ps> (Last accessed: 17.11.2010.)

<sup>7</sup> Blog to Assoc. prof. Matt Walsh at Harvard University. <http://matt-welsh.blogspot.com/2010/05/secret-lives-of-professors.html> (Last accessed: 17.11.2010.)

## 2.2 Publications

Think of publications from day one! You must of course have something to publish, but the work on publications, and particularly work driven by “deadlines” before conferences (“call for papers”) or special issues of journals, is highly motivating. Still it is so that even if we do not always work best under pressure, then our efforts are being at least the most. (If you are not able to publish your results, there is no point reading the rest of this article – you will never become a professor.)

In a project, often both partial results and final results can be published. In addition, ideas and design ideas often can be published in “Letters” or “SIG Notes” or “Technical Reports”. These publications will time stamp your work, making it easier to show that at the time when you were working on the problem, it represented unploughed mark. (You must of course consider the danger that by showing what you are work one may intensify others “hunt” for the same results.)

Try to aim to publish at least two articles per year in international journals or at recognized international conferences with referees. It's amazing how fast time goes by, so start today! If you are in doubt whether something can be published, you may let external “referees” determine your dilemma. Should the work not be accepted, you will still get very valuable feedback on your work. However, you should keep in mind that the publication forever will be a personal advertisement. Also, keep in mind that your preliminary results may influence your competitors’ work in their own projects. A novel paper should be published in the highest ranked journal possible.

It is, in the end, *only* publications you will be measured by – not by the number of hours you have spent in your office, not by the number of lectures you have given, not by the number of students you have supervised, not by the number of committees you have served in, not by the number of administrative notes you have written, not by how many sleepless nights you've had, not by how many outstanding scientists you've met, etc.

In my research group, possible new scientific papers and publication channels (conferences, journals, etc.) are on the agenda for each meeting. Sometimes only in terms of what deadlines are approaching. Other times we discuss the journals the group members should prioritize. I have made a list of Level 2 publication channels that everyone must know about. Yet one of the biggest surprises the team members get when they spend time with excellent foreign research groups, is the extreme focus on high-level publications that many of these groups have. Paper suggestions appear in any discussion.

An employee in a faculty position is intended to handle at least three different tasks:

- 1) *Research*: planning, obtaining funding, implement and communicate the results of the research.
- 2) *Teaching*: planning, administering and teaching at all levels.
- 3) *Dissemination*: Preparation of popularized lectures and presentations, participate in public debate, legitimize and publicize research to the community.

In addition, the majority of such positions also include several administrative tasks.

In the “Guide for applicants for professorships at the Faculty of humanities, University of Bergen” the evaluation committee is in the ranking of qualified applicants asked to weight the dimensions of competence I, II and III as follows:

I.	Academic qualifications	4
II.	Teaching Experience	2
III.	Administrative experience	1

This can also be interpreted to indicate that research counts twice as much as teaching, which counts for twice as much administrative work. Priorities should be given in accordance with this! In science and technology, we will also have a fourth dimension – international experience – with the same weight as administrative experience. In addition, academic qualifications have a greater weighting. (Note that the weighting only applies to applicants who meet the research requirements.)

Create a good filing system – you will seek promotion in a couple of years. A good application<sup>8</sup> with all attachments may require a week's effort, given that you have an updated CV and copies of all your publications available. Note that an evaluation committee may want to see and study all your work, including technical reports and publications of partial results. You better show continuous academic effort by also referring to the less important works.

Professor David Patterson<sup>9</sup> recommends that once you become employed in an academic position, you should furnish a home office with the same amenities and qualities that you have in your office at work (“on campus”), and that you should spend your most productive time in your home office. In this way you can, as distinct from your job office, work uninterrupted. One should, he says, make sure to be on campus from lunch and onwards due to lectures, contact with students and colleagues, and to safeguard the social aspects.

Patterson recommends that you should learn to say no (in a polite manner) and that you make to-do lists, both daily, weekly and on annual basis, and that you read e-mail at most once a day (and then in your least productive period).

### 2.3 Family and children – children should take time

Perhaps the most sensitive issue in terms of career development is the respect for partner/spouse and children. It is said that you become more effective when you have (young) children. This is also my experience, but my total effort had nevertheless to be significantly reduced when I got my own children. I often feel that the lunch must be sacrificed in order to manage to do as much as possible before I have to leave my office. The number of discussions without strong academic foundation was significantly reduced after I had to visit the kindergarten before half past five. (On the other hand, it's great to have a job where you can give your family priority!)

It is important to discuss work-related expectations with your partner/spouse. It is difficult to get up sufficient speed and keep going (read: keep in touch with the research frontier). The priority is solely up to you. Nevertheless, you must let all close to you understand that research is a life-style.

But children do not have to be a limiting factor for your own research. Professor Hege Skjeie said in an interview that:

*“I never thought about having family and children is to give up something. On the contrary. You choose to vote down your kids in order to devote yourself to research. At least does not my generation of women this choice. I do not think that universities and research institutions are the worst places to be when you want to maintain a family life. I actually think there are far worse places!”<sup>10</sup>*

Another example is Kristine B. Walhovd, who at the age of 30 years was employed as a (full) professor of psychology at the University of Oslo. In an interview in the University of Oslo's internal newspaper, she was asked how it was possible for a mother of two small children and a wife to an equally ambitious professor to be able to qualify to become a professor [at such a young age]:<sup>11</sup>

*“The most important assumption is that we've got both our children into the kindergarten at the university. After the last birth my husband and I have shared ma-*

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<sup>8</sup> Cf. (Hartvigsen, 1998, pp. 131-135). Application Writing is in its own an art. Adjudication Committees experience unfortunately too often that applications are incomplete. Through writing a good application, you have the opportunity to both manage and assist the committee in its work.

<sup>9</sup> Cf. footnote No. 6.

<sup>10</sup> “Maktutreder med innlevelse”, Apollon, No. 1, 2001. (Journal at University of Oslo, Norway.) (In Norwegian) <http://www.apollon.uio.no/vis/art/2001/1/portrett> (Last accessed: 17.11.2010.)

<sup>11</sup> “30 år, professor og småbarnsmor” (“30 years old, professor and mother of young children”), Uniforum nett.no, 04.10.2007. (Web-based newspaper at University of Oslo, Norway.) [Original in Norwegian (nynorsk).] <http://www.uniforum.uio.no/nyheter/2007/10/30-aar-professor-og-smaabarnsmor.html> (Last accessed: 17.11.2010.)

*ternity leave between us, so we have been able to work part time. Since we both now are professors of psychology, none of us can use the argument that my job is more important than your job. Thus we can divide the tasks between us without any dispute,” she emphasizes. “Both children are in kindergarten between seven and eight hours each day.”*

Bobby Schnabel<sup>12</sup> gives the following simple advice with respect to family and career in science: “You need to decide what is important to you and enforce your priorities, the world won’t do this for you.”<sup>13</sup> Schnabel asks several times in his speech the question: “Can you have an academic career and still have time for; Children’s activities? Community service?” His answer is the same – this you must determine and prioritize yourself.

Children need a lot of attention throughout childhood. For many couples where both have their careers to take care of, children involves more negotiation, more compromises and more planning than what most people are prepared to do in advance.

What outstanding scholars are willing to sacrifice on the family's behalf shows well the following story about Linus Pauling (2 times Nobel Prize winner) (Bernstein, 1996, p. 158-159):

*“... One of the strings he [A.A.Noyes at Cal Tech] pulled was to arrange for a Guggenheim Fellowship to allow Pauling and his wife to go to Europe to learn the newly developing quantum theory. They left Portland by train for the east coast and Europe in Mach 1926. One of the curious things about their departure is that they left their not-quite one-year-old son, Linus junior, behind in the care of Pauling’s maternal grandmother. They would not see him for a year and a half.”*

Professor emeritus Torsten Husen said in an interview in the Swedish journal “Universitetsläraren” that: “Should he have read the proofs of his life, he says now – like so many other men with busy careers – he would bring more time for the children in his life script. Otherwise it's not much he would have liked to have done differently.”<sup>14</sup> No matter what one may think about the arguments above, the essence is that one must accept that one cannot have it all. If you have family, then you have to accept that those who do not have family obligations may do more research than yourself. Thus the advice number three could as well be named: *Make sure you allocate sufficient time for meritorious work.*

## 2.4 Lectures

My experience is that the preparations of lectures consume all the time you set off – the sooner you start the more time spent on preparation. Once you have started the preparations, your subconscious will be constantly working on the lecture – not your research problems. The reason might be that it is easier to work on the lecture – it is more structured and easier to handle. The quality of the lecture does not necessarily become twice as good if you use twice as much time for preparation. (Sometimes the result may actually be the opposite – you have too much teaching materials and manage just to get through the half before the class is over!)

Be aware what you are given credit for in the work obligation rules (Norwegian, “arbeidspliktreglementet”):<sup>15</sup> 3 hours preparation per lecturing hour, 1-2 hours preparation per colloquium hour. But if you find your lecture to be an embarrassing affair you have not prepared yourself sufficiently. It is important for your own professional development to teach every year.

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<sup>12</sup> Bobby Schnabel is Dean at School of Informatics and Computing, Indiana University, USA.

<sup>13</sup> Lecture at Computing Research Association’s (CRA) Career Mentoring Workshop, February 22-23, 2010. <http://www.cra.org/uploads/documents/events/cmw/2010/CMW2010.Schnabel.pdf> (Last accessed: 17.11.2010.)

<sup>14</sup> Interview with professor emeritus Torsten Husén in the Swedish journal “Universitetsläraren”, No.13, 1999. (In Swedish)

<sup>15</sup> This will to some extent vary between institutions. The figures in this article are from the University of Tromsø.

Restrict the use of tools such as PowerPoint, the first time you give a lecture series – you should consider to wait with the making of PowerPoint presentations for all lecture hours until the next time you give the same course.

## 2.5 Supervision

Students at the master's level may be an important support in your own research. Remember to “overbook” – it is perhaps only 30-40% of the students that deliver results that can be ploughed directly into your own work. But whether you see benefit from the work that students perform or not, if you accept to supervise students (i.e., accept to be the supervisor/co-supervisor), then the students must be given appropriate follow-up. It is best to limit all the guidance to one day of the week. For some students, it is sufficient to have supervision every second week, for other it is necessary to see them on a daily basis. Set requirements for students so that they are prepared and can show progress. Be polite, positive and constructive in your criticism of students' work. You must by all means avoid being classified in the same “class of feedback” as professor Wolfgang Pauli (Bernstein, 1996, pp. 240-1).

*“Guth had made the mistake of interrupting Pauli during a lecture to offer some unwanted bit of erudition. After listening for a moment or two, Pauli had said “Guth, whatever you know, I know.” There was no way I was going to set myself up for the same treatment.”*

My experience with notabilities in my own field is that they thankfully are fundamentally different from what Guth experienced – the greater the academic authority the more spacious and friendly people have been. (It is possible they all have Mario Puzo's book “The Godfather” in mind. A service today will be a return service tomorrow!)

Note also that in some disciplines, successful supervision of doctoral candidates is one of the requirements for a professorship. There is also a big difference to guide students at the master and doctoral level. The latter group will generally contribute positively to your own academic progress. Within science and technology all doctoral students work in their supervisors' projects and are very important contributors to research in these projects. If you are lucky enough to get a post-doctoral fellow<sup>16</sup> to work for you, the possibility is high that your number of co-authored publications will increase more rapidly.

## 2.6 Lecture-less-time

All periods without lectures must be viewed as resource periods where you can do research uninterrupted. But do not postpone everything to such periods – then you could easily be paralyzed. Anyway – lecture-free periods are not the right time for battery recharging. (For the record – I do not put holidays into this category.)

Professor David Patterson recommends that you should plan your activities on both days, weekly, monthly and yearly basis. If you follow this advice, you will be able to plan your research on a long-term basis.

## 2.7 Skill level

Accept your skill level – are you a research fellow you should think that what you write must be on a research fellow's level. And, again – if you are in doubt, refer the quality assessment to the referees. It is allowed to participate, and also to benefit from participation, even if you do not play in the highest division! Do not allow any criticism from jealous colleagues stop you. After a while you might have passed them. Remember that your competitors are not located locally. (A better strategy is obviously to try to cooperate with someone who already is in the highest division. It is not a coincidence that over half of the Nobel Prize laureates have worked with previous laureates.)

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<sup>16</sup> A postdoctoral fellow (or "postdoc") is a "fresh" doctor (PhD). A postdoctoral fellow usually have only one task – to do research.

## 2.8 Research group

Good experimental research cannot be made anywhere – researchers need good working conditions. This is attempted illustrated in Table 1. Research scholars and faculty members have essentially to follow the same criteria in order to succeed in research. For the group “faculty member” I had in an earlier version of the table placed “time” last on the grounds that “if it was just exciting enough faculty members will make time for research.” After being toddlers dad between 16-23 in weekdays and between 08-24 in weekends, department chair, project manager, taught two courses a year – in short – work 160% of full-time position at the University of Tromsø and additional 20% as adjunct professor, I had to admit that it was not possible to “clear my timetable” to make room for research.

*Table 1 Success criteria for research scholars and faculty members. The criteria are listed by importance, where 1 has the greatest importance.*

Research scholars	Faculty members
1. Time 2. Supervisors who are interested in the work 2. Research colleagues 2. Good access to literature 2. Assets 2. Modern equipment 7. Technical support	1. Time 1. Access to research assistants 3. Good access to literature 3. Assets 5. Modern equipment 6. Research colleagues 7. Technical support

Many of us work together with others in a research group. Assoc. professor Stefan Savage has a simple strategy for cooperation:

*“However, by far, the most important strategy is a very simple one: try to work with people you really like. I can’t emphasize enough how much this matters since this colors almost everything else. If you have a choice of places to work, I’d pick the place with one or two people you really really like, over a “higher ranked” place any day. If you are hiring people, don’t fail to consider how much you’d like working with them. If you don’t have people you like where you work, then work with people elsewhere who you do like. I think I’ve done all of these and have continually underestimated the value each time.”<sup>17</sup>*

There has, rightly, been argued that the working conditions of Norwegian academics are poorer than those of the countries we want to compare ourselves with. Professor Toril Moi, Duke University, told the Norwegian magazine “Forskning”<sup>18</sup> that:

*“... I have the impression that working conditions for faculty members are poor. There are several aspects of university life in Norway that makes it difficult to get enough time to investigate, to read and to write new stuff, and this is important to me as intellectual. The Duke professor thinks back on the three years she worked as a researcher at the Centre for Humanities Studies at the University of Bergen as fairly non-free compared to what she is used to now.*

<sup>17</sup> Comment (added 24.5.2010) on Assoc. prof. Matt Welsh’s blog: <http://matt-welsh.blogspot.com/2010/05/secret-lives-of-professors.html> (Last accessed: 17.11.2010.)

<sup>18</sup> “Et menneske — ikke bare en kvinne” (“A human being – not only a woman”), newspaper “Forskning”, No. 5, September, 1998, page 11. (Research Council of Norway) <http://www.forskning.no/artikler/1998/1017754974.13> (Last accessed: 17.11.2010.) (In Norwegian)



*You had to be in the office during normal office hours, unless you had a good reason to stay somewhere else. At Duke, I'm just in the office when I have visiting time or meetings. Otherwise, I work at home, like most other American academics. - If I had fixed office hours, I'd always been available to students and talkative colleagues. How would I then have time to write?*

*Moi also remember her working year in Norway where it was difficult to get time off to go to conferences abroad, if this did not fit completely into the examination intervals or teaching plans.*

*In the U.S., we do not use the term "get free to do" (Norwegian, "få fri til"). You just organize things so that you do. We also have no examination work. I do not teach a curriculum, but decide what to teach in. It means that I can adjust my lectures to the research I'm actually doing and what I am myself most interested in. As long as I am doing research or giving lectures or doing something else that gives me a clear profile, Duke University assume that it is good for them."*

Now it must in fairness be said that the qualification requirements for permanent employment ("tenure") in the U.S. and Norway are different. After an American 5-6 years "tenure track"<sup>19</sup> race (in which people are working 70-80 hours/week or more), an assistant professor has in many competence areas probably passed the requirements for a Norwegian professorship. In this way, you are assured that those who are permanently employed are productive researchers and probably will remain productive researchers. In Norway, people might be permanently employment without the need to have documented substantial international research expertise – and even if they have a Ph.D., it does not indicate that they have many international publications, nor that they have proved able to successfully supervise PhD candidates, managed to attract research funding or establish a good research group.

Poorer conditions for research and lower salaries may be the price we must pay if we want permanent employment on the basis of inadequately documented research qualifications?

## 2.9 Administration

You should just accept it as a fact: administrative tasks are demanding. You must accept that administration is considered to be a profession on its own. Operation of academic institutions, particularly management of research and higher education, requires involvement of employees in scientific positions. Often Murphy is right, too.<sup>20</sup> At university departments, there are a number of honorary posts to be filled: Head of Department, research manager, education manager, etc. Faculty members are expected to participate on boards and councils at the departmental and at the faculty level,<sup>21</sup> too.

While such honorary posts may be instructive, you should leave the most demanding positions to the professors. This is especially true for positions as head of department, dean, etc. It is expected, of course, that you should contribute to the management of the department, but, for exam-

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<sup>19</sup> In the U.S., the road to permanent employment in academic positions ("tenure") has traditionally been through a "tenure track" race at 4-7 years. During this period, you should demonstrate that you are eligible for permanent employment. 50-70% are offered "tenure", the rest must leave the university.

<sup>20</sup> Murphy's Law was designed by Edward A. Murphy, jr., John Paul Stapp and George Nichols in the 1940s. In simplified form, the law has become known as "Anything that can go wrong, goes wrong." The three engineers investigated the effect of a sharp deceleration of the people at Edwards Air Force Base in California in the late 1940's when Murphy cursed the technician who had performed an experiment error: "If there is a way to do it wrong, so he will probably find it." In the legislation, this has become: "If there are two or more ways to do one thing, and one of those ways can result in a catastrophe, then someone probably do just that."

<sup>21</sup> This is according to the Norwegian university system in which we have Faculties consisting of several Departments, e.g., Faculty of Science that includes the Departments of Computer Science, Physics, Chemistry, Biology, etc.

ple, the role of head of department may postpone your promotion to full professor with a minimum of years equivalent to the number of years you are in office. In stead, you should contribute in the more controllable – and limited – of the honorary posts or committees before you become a professor. (Note that for promotion to professor, administrative experience is one of many factors considered.) Professor Bobby Schnabel, dean of the School of Informatics and Computing, Indiana University, gave as the “Department Chair” the following simple advice to “Early-Career Faculty”<sup>22</sup>: “Don’t try to be a full professor as an assistant professor”.

If there is a preponderance of professors at your unit, it is nice to think that your turn will come when you yourself have become a (full) professor. (For the institution it may be advantageous, for example, that the department leadership role is filled by a person with more experience than you.)

“Sometimes it feels as if the working day only consists of meetings”, says Assoc. professor Matt Walsh at Harvard University:

*“Your time is not your own. Most of my days are spent in an endless string of meetings. I find almost no time to do any hacking anymore, which is sad considering this is why I became a computer scientist. When I do have some free time in my office it is often spent catching up on email, paper reviews, random paperwork that piles up when you're not looking. I have to delegate all the fun and interesting problems to my students. They don't know how good they have it!”*<sup>23</sup>

For many of us who have been around for a while in academia, meetings are unavoidable. For a department it should be a goal to distribute the workload evenly so that a few people not get the entire burden. Sometimes you have to recognize that you cannot be everywhere. 1<sup>st</sup> April 2009 was, for my own part, one of those days. I had six parallel meetings – they were all important meetings in which I was expected to participate: 2 in Oslo, 1 in Trondheim and 2 in Tromsø. (I had not initiated any of these meetings.) I chose to participate in the research council's meeting for CRIs (Centre for Research-based innovation), since I am the leader of a CRI. The positive effect of this major meeting collision was that I could politely turn down the other five meetings.<sup>24</sup>

## 2.10 Stay away from Internet and other time thieves

There are many dangers that lurk along the road to a professorship. One of them is called the Internet. It is very easy to become immersed in all that you can find or do online. Try to steer clear of any non-productive surfing and excessive use of social media! Use Internet search in moderation.

Another danger is called PowerPoint (cf. Section 2.4). This applies to both PowerPointification of teaching material and searching for fancy illustrations to PowerPoint pages. Limit the use of PowerPoint-related search, i.e., searching the web for examples, etc.

This message applies to all types of activities that will take your attention away from research, e.g., housing, moving, etc. You should of course not “withdraw” from society – and especially not from your family and friends. The point is rather that you should plan how to best carry out your research in addition to the tasks family, friends and society demands from you.

## 2.11 Be persistent!

Persistence or stubbornness is a condition to achieve good academic results. Persistence can compensate for most weaknesses! Find out when you are most creative, and utilize this

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<sup>22</sup> Cf. footnote 13.

<sup>23</sup> Blog to Assoc. prof. Matt Welsh at Harvard University.

<http://matt-welsh.blogspot.com/2010/05/secret-lives-of-professors.html> (Last accessed: 17.11.2010.)

<sup>24</sup> I also had to say no to a FAU meeting at a secondary school that afternoon – the meeting took place when I sat on the plane home to Tromsø.

knowledge! (Personally I work best between 8 PM to 2 AM – during this period I am both most creative and most productive.) Remember that research is not a vocation, but a *lifestyle*!

As a ten-year-old boy, Andrew Wiles found a book at the municipal library of the French mathematician Fermat's last theorem in the 17th century.<sup>25</sup> 30 years after he started the work to solve the riddle and almost eight years later he had found a solution. In an interview in Uniforum Professor Wiles told what happened at work in his room on Monday, 19. September 1994:<sup>26</sup>

*“I found out that the solution to the problem lay in the attempt I did with the Iwasawa theory three years earlier. It was the most important moment in my entire working life. Nothing of what I'm going to do in the future will exceed this. This was a revelation that it is impossible to describe. It was just incredibly beautiful, so simple and so elegant that I just sat and stared in disbelief for over 20 minutes. The rest of the day I went back and forth in my office just to check if the solution I had come forward with was still there. First, at 11 the next day I was confident enough in my case that I could tell my wife that I had finally gotten it right.”*

In 1637, Fermat claimed to have discovered a proof of the theory but that he did not have enough space in his book to present it. Over 350 years mathematicians worldwide had hunted for the proof of Fermat's last theorem, before Andrew Wiles finally found the proof 19. September 1994. An achievement that was partly a result of extensive work.

In an attempt to find out what determines a person's creativity, Catherine M. Cox found in 1926 that all the 300 prominent people she studied had equally high intelligence, but that the personality was equally important. Cox found that high – but not the highest – intelligence, combined with the highest degree of persistence led to better results than the highest degree of intelligence combined with less endurance.

Professor Johan P. Olsen said in an interview in the magazine *Morgenbladet*<sup>27</sup> that: “Olsen serves a kick to those who believe that time spent in line with Norwegian working regulations promote science in the world: - 37 hours a week is just not enough. I do not think it is possible to compete internationally if you are not working about as much as leading scientists around the world are working.”

Louis Pasteur is quoted as saying: “Let me tell you the secret that has led me to my goals. My only strength lies in my tenacity.” Professor Richard Hoffmann, a world-class biologist, argues that: “I think that anybody who's going to make a contribution to science has got to be almost pathologically motivated. A person who is going to be good in science should be as dedicated as a person who's trying to make the Olympics.”<sup>28</sup> There are no shortcuts to success in research – good scientific results require intense concentration and prolonged effort. If you know for yourself that you have neither the time nor the interest to invest in the effort that is required to come up with new results, it is hardly wise to pursue a scientific “career.”

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<sup>25</sup> Fermat based his work on Pythagoras' doctrine (theorem) for the right-angled triangles:  $x^2 + y^2 = z^2$ . Fermat claimed that this equation is not true for  $x^3 + y^3 = z^3$  or for any equation  $x^n + y^n = z^n$ , where  $n$  is greater than 2 and  $x$ ,  $y$ ,  $z$  and  $n$  are positive numbers successfully.

<sup>26</sup> Uniforum, 16.6.2002. (Web-based newspaper at University of Oslo) [Original in Norwegian (nynorsk).] <http://www.uniforum.uio.no/nyheter/2002/06/matematikaren-som-loeyste-fermats-siste-teorem.html> (Last accessed: 17.11.2010.)

<sup>27</sup> “Ser med undring på det meste” (“Looking with wonder at the most”), portrait interview with professor Johan P. Olsen, *Morgenbladet*, Vol. 190, No. 49 (17 to 23. December 2010), pages 16-17. (In Norwegian) In the interview, Olsen stated that: “Working weeks have been 60 hours long, the nights six hours short, and the academic requirements for both himself and others very high.”

<sup>28</sup> McDonald, K. (1981). What has up to 752 feet and could prove that continents drift? The millipede, says Radford U. Professor who spent 35 years studying the animal, *The Chronicle of Higher Education*, 33 (No. 5), pp. 5-6.

## 2.12 Be strategic – not cynical

It does not hurt to think a few moves ahead, whatever you do. Be sure to take with you a (virtual) post-it with the following text: “You will not become a professor in this way.” In the same way as a working title, this saying will be able to control your actions! The time will not necessarily slow down if you do not conduct any research.

Another good advice is that you should establish connections – not curses. I.e., not to get ahead at others expense. (This means, for example, that you must assume you should take on your share of joint liabilities such as administration, teaching, etc. But it is not expected to do more than your share before you become a (full) professor.)

In many research communities, particularly in science and technology, international cooperation is highly appreciated. Therefore, it is of strategic importance to encourage collaborative research across national borders, particularly in the form of joint publications.

It may also be helpful to have Professor David Patterson's words in mind: “Learn to say no (but in a polite way).” No one expects you to take on unreasonable tasks. There is no one who later come to thank you if you have postponed your own activities in order to better take care of the community's needs.

## 3 Discussion

We have in the previous chapter been introduced to 12 success criteria for how to become a (full) professor (before age 40 years). These are: (1) accept professional challenges, (2) always consider publishing; (3) children should take time; (4) limit preparations; (5) have fixed supervision time; (6) lecture-less-time = time for research; (7) accept your level of competence; (8) establish an infrastructure for research; (9) leave the heavy honorary posts to professors; (10) stay away from Internet and other time thieves; (11) be persistent; (12) be strategic - not cynical.

Personally I will say that I have tried to comply with all the 12 rules. This is perhaps why I became a (full) professor before many of my colleagues. In summary, I would say that I became a professor at a relatively early age as a result of:

- Large capacity for work (before my oldest son was born in 1994)
- A small dose of strategy
- A little luck
- Good timing
- Laziness

The last point (“laziness”) must be explained a bit further. The explanation is quite simple – I hate wasting work effort. I have therefore had a standing question: “How can I use this (to promote my own career)?” I.e., I have always tried to look around the next corner.

This strategy includes, e.g., to as often as possible to consider how regulatory responsibilities could also be used to document my own level of expertise. With luck, I mean here that I had the opportunity to participate in projects that others had provided funding to (and who gave interesting and good results). Good timing is related to strategy and luck – how to get a continues stream of scientific publications.

Is it possible to avoid not becoming a (full) professor if the suggestions above are followed? The answer is “no”, i.e., because everyone who is employed in permanent faculty positions (tenured) should have completed a postgraduate education (doctoral degree) and thus have started to do research on an international level. The most important rule is probably No. 2 that said you always have to think about publishing. If you follow this rule and publish two solid research articles per year, you can hardly fail to become a professor.

You will obviously not become a professor without having to apply for it – either by applying for a professorship at your own institution, applying for professorships at other Norwegian institutions or by submitting an application to the national promotion committee. (Qualification from

abroad requires Norwegian validation.) A good application requires weeks of effort. A well-written application will prevent you from getting an unfair assessment. It happens all too often that the applications are incomplete, for example with regard to the selection of submitted works, commenting on their work, discussion of professional aspirations, etc. (See Hartvigsen, 2002, for an introduction to writing academic job applications.)

Many people have asked me whether I believe that one must be cynical to reach to the top academic position. The answer to this question is “no”. I firmly believe that I have taken my share of the honorary duties at my own department (and also at university level):

- My documented workload over many years corresponded to approx. 130% of the working regulations (“arbeidspliktsreglementet”). (I've been on the top of the list with respect to documented workload at the department. After I became a professor I have documented that this effort has been even higher.)
- I have had large amount of official duties at all times, both at the departmental, faculty and university level. I have also participated in various contexts at national and international level.

So it is only you who stands in the way of your promotion to full professor. All who are qualified are promoted to the top position through the Norwegian promotion scheme.

There is also a secret thirteenth rule: “You have to be a little crazy!” I.e., that you must be a little crazy to work so much that is needed to contribute with research at an international level, to sacrifice so much of your “spare time” to maintain an extremely professional focus, and to preserve self-esteem as “nerd” (in the outside world's eyes). The following quote from the BRIS magazine illustrates this point:

*“Where I come from, a professorship is not an honours designation. One is seen as a bit strange and kooky. It was probably not unexpected that I became a professor,” said Stanghelle and grins a little, but does not elaborate on that statement.*<sup>29</sup>

When it comes to work efforts of staff in academic positions, according to figures from 1991, faculty members at the Norwegian universities work approx. 50 hours/week. For the university colleges, the figures were 47 hours/week (from 1992). In the U.S., professors at universities are working on average 65 hours/week:

*“A question was raised about how much time is spent realistically on various things as a faculty member. Constable pointed out that there had recently been an analysis done of exactly that, and that faculty works an average of 65 hours/week, which didn't include time spent on weekends.”*<sup>30</sup>

A faculty position will often require efforts in several areas than people had originally envisioned when they chose this career path. Assoc. professor Matt Walsh at Harvard University, summed up his first seven years at Harvard as follows:

*“Must... work... harder. Another lesson is that a prof's job is never done. It's hard to ever call it a day and enjoy your “free time,” since you can always be working on another paper, another proposal, sitting on another program committee, whatever. For years I would leave the office in the evening and sit down at my laptop to keep working as soon as I got home. I've heard a lot of advice on setting limits, but the biggest predictor of success as a junior faculty member is how*

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<sup>29</sup> From an interview with Johan Kvalvik Stanghelle, professor in physical medicine and rehabilitation, in BRIS, No. 1, 1998. (In Norwegian)

<sup>30</sup> From Robert Constable, Brian Smith & Ronitt Rubinfeld's lecture at “Life in Academia”, Ph.D. Professional Seminar, Cornell University, 30. April 1997.  
<http://www.cs.cornell.edu/html/Courses/Spring-97/CS706/rc-bsmith-ronitt.html> (Last accessed: 17.11.2010.)

*much of your life you are willing to sacrifice. I have never worked harder than I have in the last 7 years. The sad thing is that so much of the work is for naught – I can't count how many hours I've sunk into meetings with companies that led nowhere, or writing proposals that never got funded. The idea that you get tenure and sit back and relax is not quite accurate – most of the tenured faculty I know here work even harder than I do, and they spend more of their time on stuff that has little to do with research.”<sup>31</sup>*

It is appropriate here to print one of the many comments that Walsh got on his blog after he posted the text above:

*“Matt – I agree that chasing money is one of the less fun aspects of the job. But some of the other points you raise I'd disagree with. Having talked, for example, to a number of young lawyers, I can't complain about working too hard, or my time not being my own. For the most part, I work hard because I'm excited about the things I work on. And while there's always more to do, for the most part, I can schedule it how I want. So far, it's an unusual day when I don't walk my kids to school or I'm not home for dinner; I don't mind doing some more work after they go to bed. I may be extrapolating too far here, but since (relatively speaking) I'm an “old man” and you're still a “young Turk” (in the best possible way), I'm suspecting that things will re-balance a bit for you both because you're now a parent and after you get tenure. I'm not saying you won't work hard, or that the job is always perfectly wonderful – it's not, and you're right to tell people about your experiences – but I'm betting you'll find your day's structure changing, with a bit more focus on the important things – both at work, and outside of work.”<sup>32</sup>*

Welsh's response was:

*“Michael - very true - since submitting my tenure materials and having the baby I rarely work in the evenings. Productivity is way down. Happiness way up.”*

For the hard-working scientist, there is actually another (fourteenth) secret rule: “Take a day off!” Take a day off if everything turns against you and nothing works. Do something else – go for a hike in the mountains, clean your apartment, visit a pleasant cafe, etc. It serves no one that you are sitting in your office without getting anything done.

The list of rules that are presented in this article is not exhaustive – there are many other rules that could be mentioned. One of the best candidates for a rule number 15 is: “get a mentor”. Lee et al. (2007) wrote a “feature” article in *Nature* about the mentors. The article begins with: “Having a good mentor early in your career can mean the difference between success and failure in any field.” A typical mentor is an experienced professor. The person may come from another field, but the important thing is that he / she is willing to spend time on regular conversations with you.

## 4 Concluding remarks

This article has presented 12 success criteria for how to become a (full) professor. If you manage to live up to these criteria, you will be able to be promoted to (full) professor within a reasonable time, perhaps even before you turn 40 year old. This is of course based on an assumption that you meet the intellectual demands of a professor position. Andersen (1996, pp. 35-36) argues that:

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<sup>31</sup> Blog to Assoc. prof. Matt Welsh at Harvard University:  
<http://matt-welsh.blogspot.com/2010/05/secret-lives-of-professors.html> (Last accessed: 17.11.2010.)

<sup>32</sup> Comment from professor Michael Mitzenmacher, School of Engineering and Applied Sciences, Harvard University.  
<http://matt-welsh.blogspot.com/2010/05/secret-lives-of-professors.html> (Last accessed: 17.11.2010.)

*“Many of the critical qualities that make a good academic intellectual cannot be taught. Skills can be augmented and improved by training, but no amount of opportunity or education can significantly alter the degree of intelligence or the kind of temperament that one must have to be a good professor.”*

There is much you can do already in the fellowship period. Fellows should note that a scholarship is not a job but an opportunity! And as many opportunities – it should be exploited as good as possible. Such opportunities do not come again!

In a research career, a PhD is seen as a child's birth – it is believed that with the birth, the hard work is over. But all who have children have learned how badly such a perception matches reality. It is after “birth” that the “hard work” (but also the joys and the many pleasant experiences) really begins. Most people are not aware of how hard they must work to land a doctorate, not to mention how hard they must work in continuing to maintain contact with the research frontier.

Haakon Breien Benestad, professor of medicine, said in an article in the Norwegian newspaper “Aftenposten” that as a professor they pay you “to pursue your curiosity about nature or culture; you can achieve fruitful contact with smart young people; you are incorporated into an international research community.”<sup>33</sup>

Professor emeritus Torsten Husén said in an interview: “I became what I wanted to be in my 30s. I think the professorship is the best job you can ever have, there are few professions that give more freedom margin in life.”<sup>34</sup>

It is not all who share professor Huséns view of professorial life. Professor Bill Pannapacer presented in an article in The Chronicle of Higher Education some conversations he had with established professors:

*“This is no place for a man who wants a family,” one told me. “You have to give up almost everything: marriage, children, money, stability. And for what? Pride. Reassurance that you’re smarter than anyone else. Well, the smart ones are the people who are happy. And I’ve seldom met any professor who was really happy. Even your wife will cool towards you before long, when you can’t provide adequately for your children for all your education and arrogance.”<sup>35</sup>*

I fortunately do not share the view conveyed in the quote. The explanation is that I am employed at a Norwegian university where there are more freedom to make your own choices and priorities. (In any case, before I met Cristin<sup>36</sup> and before the result-based budgets were governing the activity.) It may also be the case that expectations to a job as a professor is unrealistic. Assoc. professor Matt Walsh of Harvard University described the expectations he had for the job as a professor at Harvard as follows:

*“I came to Harvard 7 years ago with a fairly romantic notion of what it meant to be a professor – I imagined unstructured days spent mentoring students over long cups of coffee, strolling through the verdant campus, writing code, pondering the infinite. I never really considered doing anything else. At Berkeley, the reigning belief was that the best and brightest students went on to be professors, and the rest went to industry – and I wanted to be one of those elite. Now that I have stu-*

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<sup>33</sup> Haakon Breien Benestad, “Hva gjør egentlig en professor?” (“What does a professor?”), Article in the Norwegian newspaper Aftenposten, 31.08.1999. (In Norwegian)

<sup>34</sup> Interview with professor emeritus Torsten Husén in the Swedish journal “Universitetsläraren”, No.13, 1999.

<sup>35</sup> Bill Pannapacer: “The Speech That Ended My Academic Career” The Chronicle of Higher Education, Friday, January 22, 1999. <http://chronicle.com/article/The-Speech-That-Ended-My/45705/> (Last accessed: 17.11.2010.)

<sup>36</sup> Cristin (Current Research Information System in Norway) is the national system for documenting research activity at universities, colleges and other research institutions, and regional health trusts. The purpose of Cristin is to simplify the reporting of research results and annual report data, provide important quality control, and contribute to improving the visibility of Norwegian research and competence.

*dents that harbor their own rosy dreams of academic life, I thought it would be useful to reflect on what being a professor is really like. It is certainly not for everybody. It remains to be seen if it is even for me.*"<sup>37</sup>

Donald Kennedy's (1997, p. viii) advice to future professors is:

*"To the future professoriate, I will say only that you are entering a life full of the most interesting challenges—and the most important mission that can be found in a modern society. The university is above all else about opportunity: the opportunity to give others the personal and intellectual platform they need to advance the culture, to preserve life, and to guarantee a sustainable human future. Could anything possible matter more than that?"*

What should you do when you become a professor? Based on their own experiences, Janice Cuny and Bobby Schnabel recommend freshly professors to:<sup>38</sup>

- Supervise seven graduate students per year
- Write several papers
- Teach fewer courses, but feel free to introduce new courses
- Jump into new field of research while keeping the focus in existing-existing field of research
- Hold approx. five conference presentations per year (but no more)
- Participate in not more than three committees per year
- Feel free to participate in several committees in professional organizations

Do not get frantic concerned about results – allow yourself to take things as they come. Moral: In the Norwegian university system, the only person you can blame for not becoming a professor before the age of 40 is yourself!

Nevertheless: "Being a professor is a real pleasure."<sup>39</sup>

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<sup>37</sup> Blog to Assoc. prof. Matt Welsh at Harvard University.

<http://matt-welsh.blogspot.com/2010/05/secret-lives-of-professors.html> (Last accessed: 17.11.2010.)

Welsh decided in 2010 to leave Harvard and his "tenured position" in favor of a position at Google in Seattle.

<sup>38</sup> Lecture at Computing Research Association's (CRA) Academic Careers Workshop, June 1997. ([www.cra.org](http://www.cra.org))

<sup>39</sup> "Being a professor is a real pleasure" (Norwegian, "Å være professor er en fest"). Statement from professor Steinar Westin at NTNU to the university newspaper "Universitetsavisa", 31.8.2008. ("Arbeid er en fest", Universitetsavisa, 31.8.2008. [http://www.universitetsavisa.no/ua\\_lesmer.php?kategori=nyheter&dokid=4a9ac618470da0.37085289](http://www.universitetsavisa.no/ua_lesmer.php?kategori=nyheter&dokid=4a9ac618470da0.37085289)) (Last accessed: 17.11.2010.)