

Improvement plan for me as a supervisor*

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Abstract. How can we develop and/or improve our supervisory skills for a modern doctorate? Is there a handbook for doctoral supervisors? What are the most challenging goals for a newbie supervisor? These and similar questions are investigated in this personal improvement plan which is an outcome of the SRS (Supervising Research Students) course at Chalmers University of Technology. Is this a guide and a how-to-do for everyone? Probably not, but it briefly summarizes the author's point of view on this specific topic. However, there is a chance that this approach could be helpful for others as well.

Keywords: Supervision · PhD study · Development plan · Students · Academic life.

1 Introduction

"Helping a new scholar to become an independent researcher is a significant achievement." one can read at the beginning of the report *"Good Practise Guide for Supervising PhDs"* [1]. That is true, it is really a significant achievement, and also a big responsibility. It is the supervisor's task/role to educate creative, critical and autonomous researchers. In addition, skills development should be driven by the doctoral candidates themselves, in consultation with their supervisor/supervisory team, in order to become independent both in their research and in their personal development [2].

Fortunately, the majority of supervision experiences are very positive [3]. In addition, many students and supervisors stay in contact for the rest of their academic careers, some even become life-long friends [4]. However, across the globe, doctoral education is in the throes of change. Diversification, regulation and proliferation are just a few of the developments that pose major challenges for those supervising doctoral candidates [5]. Furthermore, we are not all born with an innate ability to provide high quality supervision the first time we take on a student. Most of us need some guidance, which can be obtained by self-education/auto-training and/or by attending some courses in supervision [6] such as the SRS* course provided by Chalmers University of Technology.

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This improvement plan sketches some goals, which I think are/will be challenging for me, and a plan how I can improve myself by reflecting on my existing experience and the ideas and concepts that were presented and discussed during the SRS course at Chalmers.

The rest of the improvement plan is organized into three sections. The introduction is followed by preliminaries and goals/problem formulation in Section 2. The coping strategies are described in Section 3. Finally, Section 4 closes the paper with some concluding remarks.

2 Preliminaries and goals/problem formulation

Personally, I can say that I am a newbie in PhD supervision. However, I have several laboratory course teaching, instructing and examining experiences. I have always put a great emphasis on transparency, high knowledge level and satisfaction of the students. I tried to increase the courses transparency by creation of an interactive instructional web page for laboratory courses, which greatly facilitated the students work. I introduced several open-source program tools and solvers to students in order to allow them working after the lesson at home as well. Furthermore, since 2013 I have attended all the IFAC¹ Symposia on Advances in Control Education in order to present my educational research results and gain new experiences in this area, too. Currently, I am working on a new robust output-feedback LQR² toolbox for Matlab³ and Octave⁴ [7] and my plan is to implement it in the teaching process as well. Furthermore, maybe it is just my luck, but all of my bachelor/master projects were "prior" in some way. Every project/group/student was different, with different highs and lows [8] (for example Fig. 1). Only one thing was common in all. Each project/group/student had given me something that I was able to take with me and use it later. It is like evolving. My supervision skills are evolving and I want the best out of it.

It follows from the foregoing that for me to become a good supervisor and teacher is of utmost importance. Therefore, it is necessary to be aware of the goals of PhD education as well as the role/tasks of doctoral supervisor. The definition of *doctoral supervisor* briefly reflects the main goals and roles.

Definition 1. [9] *A doctoral supervisor (also dissertation director or doctoral advisor) is a member of a university faculty whose role is to guide graduate students who are candidates for a doctorate, helping them select coursework, as*

¹ International Federation of Automatic Control.

² Linear Quadratic Regulator.

³ MATLAB is professional commercial software that combines a desktop environment tuned for iterative analysis and design processes with a programming language that expresses matrix and array mathematics directly.

⁴ Octave: scientific programming language, with powerful mathematics-oriented syntax with built-in plotting and visualization tools. Octave is a free software, runs on GNU/Linux, macOS, BSD, and Windows. Drop-in compatible with many Matlab scripts.

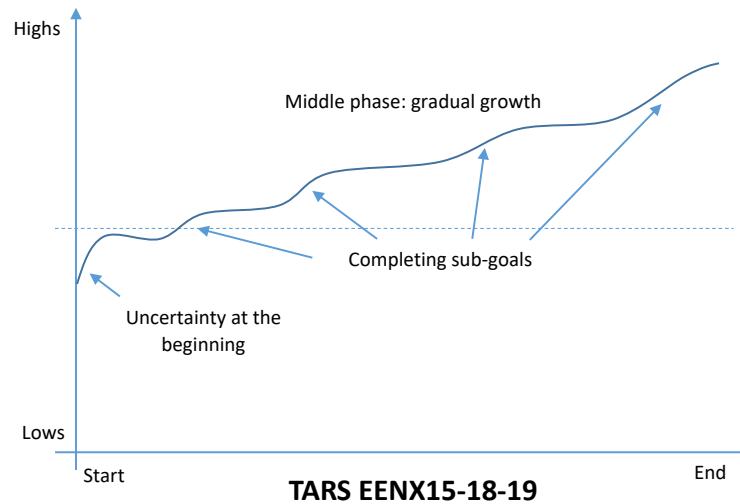


Fig. 1. Highs and lows (based on [8]) for one of my bachelor groups from last year. This group was extremely successful. They have got international publicity as well.

well as shaping, refining and directing the students' choice of sub-discipline in which they will be examined or on which they will write a dissertation.

More detailed goals of PhD education are defined on national level by the Swedish Parliament (Riksdag) [10] as well as locally on Chalmers level [11] which gives the general framework for the supervisor. However, more precise and detailed goals are often set by the generic syllabus (ASP) on department level and/or by the individual syllabus (ISP) on supervisor-student level.

Based on the foregoing I can formulate my main goals/challenges as follows

- a) **Support the PhD student to become an independent researcher:** this is one of the biggest challenge (especially for me as a beginner). As it was pointed out on the SRS course, *"this does not happen by default and it is an aim that goes beyond the successful completion of even a high-quality PhD thesis."* For me the most challenging sub-task within this is to find the optimal balance between hands-on and hands-off techniques throughout the PhD journey. The optimal balance is individual, time-varying and highly non-linear. The responsibility should be increased along some *optimal function* through the time on the students side, which makes this challenge the first one on my list.
- b) **Establishing clear goals and expectations:** this challenge is essential. How to establish, communicate and clearly deliver the goals and expectations for a PhD project? Unclear goals and too high expectations are within the top five lists in many PhD surveys all around the world [12]. Therefore, for me who is a greenhorn in PhD supervision, this challenge/goal is on the second place.

- c) **Find a way to avoid stress, pressure and burn-out:** it is known that a large fraction of students at Swedish universities experience high levels of stress. Nature's 2017 PhD survey [13] also shows that this is a huge issue among doctoral students all around the world. It was also pointed out on the SRS course that this can be prevented by a good supervisor, therefore this challenge also occupies a prominent third place on my list.
- d) **Optimized publication process:** the goal is clear, how to develop academic writing skills while finding the trade-off between *Learn to Write* (LTW) and *Write to Learn* (WTL) activity? Furthermore, supervisors are mostly focusing on transferring knowledge and skills of getting the research published in journals rather than support the overall writing skills of the PhD student. However, to develop a good writing skill early is crucial not just for the first challenge but also for the supervisor as well, since it can reduce the load later on. Another sub-challenge within developing writing skills is to *prepare the student that life is often unfair*, since the student will possibly face with rejections, and with very negative, sometimes unfair reviewers, unfortunately.

3 The Legend of PhD: Breath of the Wild

Since I am just preparing to become a PhD supervisor, all the good, bad, happy and bitter moments are just waiting for me. However, as a good *scout* [14], I want to *be well prepared*. This section, presents my point of view on PhD supervision and my improvement plan, which I have prepared thanks to the SRS course at Chalmers and to the available rich literature in this field. I am planning to apply a **novel methodology**, which has worked great and has gained huge fame recently in totally different field. However, I am convinced that it could perfectly fit in the supervisory practice as well. Where does this methodology come from?

Have you heard about the Nintendo's latest title in its classic RPG⁵ series, which has succeeded by opening up a world for players to explore like no game has before [15]? The highly ranked *Legend of Zelda: Breath of the Wild*, which has also got the best game award in 2017, is considered by many reviewers as the best-designed game ever [16,17,18].

This is not an advertisement, though it seems so. This is the first game where the designers have broken the common strategy, to guide the player through experience which leads to hand-holding and linearity. *Breath of the Wild* doesn't tell players what to do, it shows them how to do what they want to do. Gentle encouragement and correction gives players a reason to keep going as they set self-directed goals and figure out how to overcome their own limitations.

"*One of my favourite things about Breath of the Wild is how totally and gleefully free the experience is,*" says Joel Burgess, world director at Ubisoft Toronto, whose past work includes *Fallout 4* and *Skyrim*. "*The game has the confidence to trust players to be the stewards of their own experience*" [15]. In

⁵ Role Playing Game.

Breath of the Wild, the job of the designers is not to hold your hand and guide you around a set path. It is reach out hundreds of hands and leave it up to you which you grab first.

Now imagine that the game is the PhD study. The designer is the supervisor and the player is the PhD student. The final goal of the player (PhD student) is to defeat Ganon (to defend the PhD thesis). However, the most important and challenging is the journey itself, the individual and unique path which leads to a stage when the player can say, *"I am well-prepared and strong enough to confront even Ganon"*, which can be seen as *"I am well-prepared with strong publication background to write and defend my thesis"*. Do you see the parallel between the game and the optimal PhD study? *"Skills development should be driven by the doctoral candidates themselves, in consultation with their supervisor/supervisory team, in order to become independent both in their research and in their personal development"*. That is, the first goal/challenge is hidden immediately in the game design and in the freedom. The game offers infinite possibilities for the player, furthermore, 4 main dungeons, 120 shrines and 900 Korok seeds, which in parallel can represent the infinite possibilities during the PhD study, the 4 main stages of the PhD study, and the plenty of opportunities which are waiting for the PhD student. It depends only on the player (PhD student) which shrine he/she opens, while the advises from the NPCs⁶ (supervisor/supervisory team) are still there to help the decisions. The player (PhD student) can whenever return to any village/stable (supervisor's office/colleagues offices) to get advice, help or upgrade.

Okay, but what about the second one, *"to establish clear goals and expectations"*, especially at the beginning? If you have ever played any game then you probably faced with the game's tutorial. The Breath of the Wild instead of a conventional tutorial mission, starts with a small region which is an intricately designed miniature version of the entire map. It has several enemy encampments to teach you about combat, different climates that introduce you to stat-boosting food and clothing, and four shrines that mirror the four divine beast dungeons, which provide the main body of the challenge later on.

Incredible, but during the SRS course it has popped up that the best would be a first 0.5–1 year long introductory project, which could be used as an all-in-one tutorial for the PhD student. This introductory project should cover most of the challenges which the PhD student may face later (such as a good tutorial session for a game). Therefore, it should cover some Learn to Write (LTW) and Learn to Talk and Present (LTTP) activities, good time and project management, courses etc. From the philosophy of the game follows that we should offer at least 2-3 possible (and safe) directions for the project as well as to offer the possibility to propose them by the student.

Now imagine that we combine the game methodology with other tools and approaches like the *Professional and personal development tool* by Julie Gold [19], the *Expectations Student-Supervisor tool* [20], the *CARS model* [21], the

⁶ Non-Player Characters.

Bloom's taxonomy [22], and finally with a good project and time management, and we get *The Legend of PhD: Breath of the Wild*.

In this new PhD world, the supervisor should learn to give hidden and well prepared directions/hints, what the player can notice, use and reuse. We can see it as a carefully designed and quite linear safe walkthrough hiding inside the huge open world, which gives a safe path for those players who need and prefer this. However, the option for choice must be always there. This is what makes the "*Legend of PhD: Breath of the Wild*" unique.

It is designed for diversity, for gender balance, it is a little bit futuristic, but still realistic, and the nice thing is, that it is fully natural. It takes into account the player's (PhD student's) tempo, mentality, and puts him/her into an environment which fully adapts to student's needs as well as satisfies the supervisor's expectations. Is it feasible and/or practicable? If the Nintendo had managed to realize this in a game on a console, then there are no obstacles to do the same in a much richer environment, in reality.

3.1 Improvement plan

Instead of a long action plan describing the whole *Legend of PhD: Breath of the Wild* concept in detail, this subsection briefly formulates my personal improvement plan in light of the ideas and concepts that were presented and discussed during the SRS course (formatted in bullet points):

- In order to establish a good relationship with my future PhD student as well as to have clear expectations from the beginning, I am definitively planing to use the *Expectation Student-Supervisor (ESS)* tool [20] and the *Professional and Personal Development* tool [19] from the beginning of the PhD study with paying attention to review it continuously (1-2 times per year).
- I am aware that providing the doctoral student with access to the right people and resources is extremely important. Therefore, I would be an invaluable resource for the doctoral student, even when it comes to good conferences, visits to other research groups, tools and development funding linked to these. Furthermore, I will make sure that the doctoral student is introduced to the working procedures of the department immediately at the beginning of his/her study.
- I am planing to continue and implement the habits of my department such as let the doctoral student to
 - give a short 2-3 min presentation at each research group and/or project group meetings,
 - give a 10-15 min overview presentation on Division meetings (1-2 times per year), and thus possibility to give/get feedback and ideas from other seniors/PhD students on their project/work.
 These are very important *LTTP* activities which are associated also with the *Learn to critically evaluate their own and others' research* activity as well.
- Thanks to the SRS course I have learned about the *Reflection Diary* [23], which I am planning to use as *LTW* activity from the beginning as well as a

weekly report about how things are going. I will read the report and provide feedback as a brief written comment, or we book a meeting based on the scope.

- Along the previous and the first points, I will put emphasis to schedule time to formulate expectations, roles, responsibilities and goals together with the doctoral student. Beside the mentioned tools (within the first point), I am planning to use an improved *Doctoral student wheel* [24] tool, namely the doctoral spider web graph (containing: work load; stress; expectations; different activities; etc.) which the student will regularly update (monthly) as part of the reflection diary.
- I will definitely suggest to the student to attend some of the courses dedicated to developing academic writing skills at Chalmers. Moreover, immediately at the beginning of the PhD study (within the *"tutorial session"*).
- Furthermore, I will support the habit at our department, to have *team building activities* within the research group (2 times per year: during fall and spring). This is a social activity, sort of get-to-know-each-other. This is usually organised by elder PhD students from the group in form like an action park visit + grill, or bowling + pizza, etc. I think it is especially important for newbie and foreign PhD students, since it supports the *"I belong here"* feeling. Moreover, I am planning to introduce a possibly new habit as an extension of the previous one, to bestow the *best internal student paper/supervisor award* in a form of cake (from which everybody eats later).

I believe that the above mentioned general concept (*Legend of PhD: Breath of the Wild*), supplemented by the improvement plan, is feasible and well applicable, and is in compliance with the Chalmers regulation as well.

4 Conclusion

Is it possible that a methodology which has conquered the game world could break the way to modern doctoral education and reform it in a novel way? I am sure it is. Of course, we need to merge this methodology with other well-proven approaches from doctoral supervision, as well as to tailor it to our own taste. But, what we could get is a methodology, and a systematic approach which puts the doctoral supervision to a new and modern perspective.

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Appendix

Revision made by feedback

Based on the feedback there were slight changes in section 3 (few sentences were added and removed), furthermore a new subsection was added (subsection 3.1), which now better reflects the personal improvement plan in light of the ideas and concepts that were presented and discussed during the SRS course.