*Transforming failure into knowledge – a guide for PhD students*

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**Abstract**

300 words

**Background**

A picture containing object

Description automatically generatedFor most students, a 4 years-long PhD program is paved with painful mistakes and failures. Failures come in many shapes and sizes – missing an important deadline, giving a bad presentation, embarrassing yourself or others in public, failing to understand key concepts, being rejected or just being late from a meeting can inflict negative emotions that can be harboured for a long time to come. Failures are painful for two major reasons; First, simply, they feel bad. Experiencing failure often also means missing out on the feeling of success and self-appreciation. Second, failure often correlates with fault and carries with a presumption that one has done something wrong. [1] On the other hand, facing failures and learning from them is considered an important path towards learning. This is underscored by the inspirational quote from the world-famous basketball player, Michael Jordan: “*I've missed more than 9000 shots in my career. I've lost almost 300 games. 26 times, I've been trusted to take the game winning shot and missed. I've failed over and over and over again in my life. And that is why I succeed.*” – in fact, the authors of the book *10 Mindframes for Visible Teaching – Teaching for Success* used this very quote as their main conclusion for their overall work, which represents the vital importance of failures in education [2]. While it is not immediately clear whether the emphasis here is on perseverance/grit [3] or an active learning from failures, the authors encourage educators to make the classroom a safe place to make mistakes where “*errors are opportunities for learning*” [2]. According to the authors, the means to reach this state is to create an atmosphere of confidence and trust where mistakes are not frowned upon but rather considered as learning opportunities. As the level of anxiety is positively correlated with the learning process, general strategies to reduce anxiety and transform failures into learning are warranted [2]. As an interesting side-note, in 2018 Google has made public its internal process of documenting and learning from failures (called “postmortems”) in the company [4]. While such frameworks are implemented at Google and elsewhere in big companies [5], no such system exists at Lund University for students. The overall goal of this project work is to develop an education tool that has a potential to reduce anxiety by offering a 10-15 minutes self-reflection/meditation/thought-process for PhD students to process their failures and transform them into knowledge. My hypothesis is that failures can be extremely useful in driving learning if they are properly analysed, processed and understood.

**Methodology**

The planned outcome of this inquiry is an educational guide that will help students identify, understand and overcome failure in an effective and productive manner on their own. I chose a digital infographic as the output medium as infographics catch attention and are “easy to digest”. Indeed, it has been demonstrated that most people are much more susceptible to learn from visual cues compared to reading. As a study has shown, after a couple of days we are more than six times more likely to remember information from an infographic than by reading text alone [6]. The following principles guide me in this creative work:

1. **Utility** – First and foremost, it should work. The tool should help students learn from failure;
2. **Simplicity** – Second, it should work in the simplest way possible;
3. **Strong visuals** – Third, it should be beautiful. This aspect is often ignored, I do not intend to do so.

I will construct a tool that will offer a 10-15 minutes self-exercise/guided thought-process/meditation that students will be able to refer to, on their own, after experiencing failure. The tool is constructed based on three major resources:

1. **A short questionnaire I put together about prior experiences on failure (filled in by 5 PhD students) (see Appendix 1 for the questions)**
2. **Google’s internal failure management system** [4]
3. **Amy Edmondson’s published article in the Harvard Business Review** [1]

Major classes by Amy Edmondson (Harvard Business School)

Preventable mistakes - deviance from rules or procedures, inattention or the lack of ability. They are easily preventable and do usually entail a percentage of individual fault. Realizing you should follow relevant rules and procedures or pay more attention next time is not exactly a spectacular finding. Thus, the learning potential of this type of mistakes is not that all too grand.

Complexity-related - This category entails mistakes which occur due to complexity of a system itself. Regardless of the application of best practices for safety and risk management, small or bigger errors remain inevitable, especially when complicated organizations and procedures are involved, and to think that these could ever be avoided completely would be ridiculous.

Intelligent mistakes - may even be considered good. These occur when experimentation is necessary and are frequently condition precedent for successful innovations and progress. Frequently, intelligent experiments, even if unsuccessful, prevent future unintelligent mistakes and losses of a much bigger scale.

FAILURE IS NOT FINAL AND IT IS NOT PERSONAL

The experience itself is emotionally-loaded.

RE-EVALUATING PLANNING

RE-EVALUATING PREPARATION

RE-EVALUATION EXECUTION

Understand / take responsibility / Say it out – own it / Document it / Remember

What are common elements of student-experienced failures? Are there any overarching themes?

## 1. Identify the most important problems.

## 2. Create a record.

* What went well?
* What didn't go well?
* Where did we get lucky?
* What can we do differently next time?

## 3. Promote growth. Not blame.

**Results and discussion**

**References**

1. Edmondson, A.C., *Strategies of learning from failure.* Harv Bus Rev, 2011. **89**(4): p. 48-55, 137.

2. Hattie, J. and K. Zierer, *10 mindframes for visible learning : teaching for success*. 2018, London ; New York, NY: Routledge. xxv, 180 pages.

3. Education, T.T. *Angela Lee Duckworth - Grit: The Power of Passion and Perseverance.* [*http://t.ted.com/f5s2aeV*](http://t.ted.com/f5s2aeV) *(Accessed: 22 March 2019)*. 2013.

4. Lunney, O., et al. *re:Work - Postmortem culture: how you can learn from failure.* [*https://rework.withgoogle.com/blog/postmortem-culture-how-you-can-learn-from-failure/*](https://rework.withgoogle.com/blog/postmortem-culture-how-you-can-learn-from-failure/) *(Accessed: 22 March 2019)*. 2018.

5. Toyota. *Toyota Production System.* [*https://www.toyota-global.com/company/vision\_philosophy/toyota\_production\_system/*](https://www.toyota-global.com/company/vision_philosophy/toyota_production_system/) *(Accessed: 22 March 2019)*.

6. Scott, H., et al., *Why healthcare professionals should know a little about infographics.* Br J Sports Med, 2016. **50**(18): p. 1104-5.

10 mindframes – I read three chapters that seemed to be relevant to mistakes, failures and anxiety in general: Chapter 6 (cultivation of culture of making mistakes), Chapter 9 (building trust, anxiety, safe place to make mistakes), Chapter 11 (Michael Jordan, overall conclusion)

Ted Talk – In this TED Talk, the lecturer talk about her experience in teaching and how the strongest predictor of success and positive learning outcomes is perseverance

Scott – A nice, succinct summary of why infographics can be successful in healthcare. I find this information also applicable outside of healthcare.

Lunney – Internal failure management of Google. Very interesting to see how big companies have procedures to do this!

Edmondson – amazing paper that redefines failure and its relationship with blame and fault

Toyota – website describing the mistake management of the assembly line at Toyota

Image source: Som Bathla: A Journey from Terrible Failures to Massive Success <http://sombathla.com/what-if-i-fail/>