

MY PHD FORMULA $P + H + D \rightleftharpoons PHD$

(FORMULA PHD SAYA, $P + H + D \rightleftharpoons PHD$)

JULENAH AG NUDDIN

Faculty of Applied Sciences, Universiti Teknologi MARA Sabah Branch, Kota Kinabalu Campus

julen856@uitm.edu.my

ABSTRACT

The highest formal academic qualification is the degree of Doctor of Philosophy. Currently, in US alone, 1.77% of its population has doctorates or its equivalent degree holders. It differs in every country depending on the quality of education system that it has. As it is the highest recognition for academic performance, a lot have dreamt to hold the revered scroll. However, quite a number have failed trying. There are a lot of descriptions for the acronym PhD; the most frightening one, Permanent Head Damage. Upon reflection, one description fits well. The formula of success for obtaining PhD consists of the elements known as strategical Plan (P), the rich health (H) and the awesome determination (D). This paper is elaborating these three elements and more, required for a person who is attempting to acquire the degree based on a review of literature and my personal experiences. Hopefully, it will be able to help those who are still fighting their way through their journey.

Keywords: doctorate; factors contributing; timely completion; attrition

1. The Formula

A chemical principle known as Le Chatelier cites that when a chemical reaction in dynamic equilibrium is disturbed, it will move towards a position where the disturbance is counteracted. Thus, in application of the principle, the reaction for PhD would only move forward when the concentration of P, H and D is increased.



Scheme 1: The PhD formula

Much has been said about PhD, among them, Permanent Head Damage is the most frightening one. Many have tried but only a few have survived. Those who desire it have asked, 'How did they do it?' I believe I have found the formula.

2. The Origin, Definition & Requirement of PhD

The history of PhD went back as far back as 1800s when it was first thought of by a German named Wilhelm von Humboldt to satisfy his quest for doing research in linguistic. He founded University of Berlin in 1810 which was later known as Humboldt University in 1949 (Nybom, 2003). It was the first university to set the tradition of awarding the highest degree to students

who had successfully contributed new knowledge through research. Through its concept of *Universitas litterarum*, the university believes that the unison of teaching and researching, the students would be more rounded in their education. The concept proved to be a successful adaptation since it has managed to produce 29 Nobel Laureates including the world-renowned Albert Einstein (Östling, 2018).

PhD is an academic degree known as Doctor of Philosophy or in Latin, *Philosophiæ Doctor*, which gives it its acronym. The term “philosophy” means “love of wisdom”, which should be reflected by its degree holder (Bogle, 2017). It is the highest degree to be awarded to a student of a university who has completed a defined programme of work, published scientific article for dissemination, produced and defended an academic dissertation, in a particular field. In addition, the degree may take three or more years to be completed with the guidance of a supervisor or a group of experts, which upon graduation, confers the title ‘Doctor’. Eventually, the highly recognised degree would qualify its holder to numerous job positions and opportunities in academics and both public and private sectors (Park, 2007).

PhD graduates are perceived as valuable assets to a country as they possess high-end skills which are required to foster productivity in developing and developed countries. In the Europe 2020 strategy, it has listed the requirement to have at least 40% of 30-34-year-olds completed higher education (EC, 2015). In our own turf, the National Higher Education Strategic Plan 2020 by the Ministry of Higher Education (MOHE) has targeted a total of 60 000 PhD candidates by the year 2020 in its effort to increase Malaysian income and increase the status of Malaysian universities (Shariff, Ramli, & Ahmad, 2015).

There are various rationales behind the journey of PhD. According to Tarvid (2014), there are two main reasons; personal or labour-market goals. He finds that those who pursued PhD personally would want to gain more learning or research experience in order to achieve some kind of accomplishment aside from contributing to science or global development in addition to attaining higher social status. On the other hand, those who are more labour-market orientation would want to compete for scholarship, better career prospects and salary or fulfil job requirement. However, whatever the reason for getting a doctoral scroll struggle seems worth it, it is rightly justifiable. On an important note, it may just be a piece of paper, but one which opens doors of possibility.

3. When the Going Gets Tough, the Tough Gets Going

Obviously, there are so many excuses to just drop it. The life of a PhD student is a cycle of frustration and elation. The joy of every day's small success can be marred by a simple act of destruction. What is depicted in Figure 1 is the common motivation curve chart that resemble roller coaster ride that has been experienced by those who have been or is going through some tough times in their PhD studies. The frustration is good when it makes you want to do better. However, at a climatic point, frustration might hinder progress, therefore it has to be managed.

The first year will always start off brilliantly thus the high motivational spirit can be observed in every enthusiastic postgraduate student. However, brace for the crashing second year when realisation sets in, when they struggled to execute their research objectives for those doing research programmes or completing demanding course works for those enrol in doctorate programmes. This is also the point of no return, either you climb out of Death Valley or sink to the bottom of the pit, joining the dispirited majority. For those who survived the major stumbling block, optimism picks up and the fight forward seem a lot less hard.

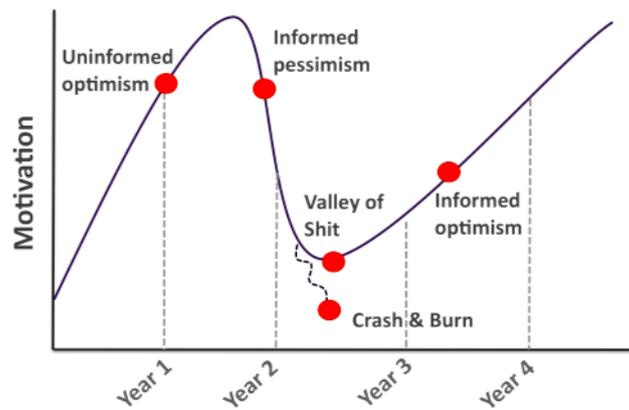


Figure 1: Motivation curve chart (Peironcely, 2012)

Understandably, there are various reasons for not completing the degree programme. In a simple perspective of the incompleteness and delay of PhD studies, they can be attributed to personal issues, effort and ability, belonging and expectation. Personal issues would vary between gender i.e. change in marital status and having children while effort and ability would focus on extrinsic factors such as the structure of PhD programme, facility etc. In contrast, belonging and expectation would relate to how the students approach their PhD studies (Bourke, Holbrook, Lovat, & Farley, 2004; Schoot, Yerkes, Mouw, & Sonneveld, 2013; Zeiser & Berger, 2012).

In a Bayesian Network presentation of factors affecting PhD completion as shown in Figure 2, the Australian authors mentioned numerous motivations (Pitchforth, Beames, Thomas, Falk, & Farr, 2014). The study has focused on a research group of students majoring in Mathematical Sciences and successfully produced a model that describes the perceived factors and quantifies the network based on 5 focus groups; former domestic PhD students, current domestic PhD students, current international PhD students, supervisors and research managers. They have identified 37 factors and 40 connections in the Bayesian Network model with an overall probability of timely completion of PhD between 0.6 to 0.8. The researchers reported that the utmost direct aspects influencing the success of a PhD study are personal, research environment & project and incoming skills. Across the ocean, a US study found almost similar findings indicating that apart from personal and research mentoring, advising on research strategies, coaching skills and publication guidance would improve the probability for the students to complete their studies (Bain, Fedynich, & Knight, 2011). This recommendation is echoed by another finding in Australia as they stressed on the importance of reviewing the quality of the degree and programme (Bills, 2003). They are implying that a good graduate program should be contained strategies that create and maintain a community of connectedness for students, the role of professors in the overall success of their students and initiatives to halt attrition and sustain success. This would provide a comprehensive program that would ensure timely graduation.

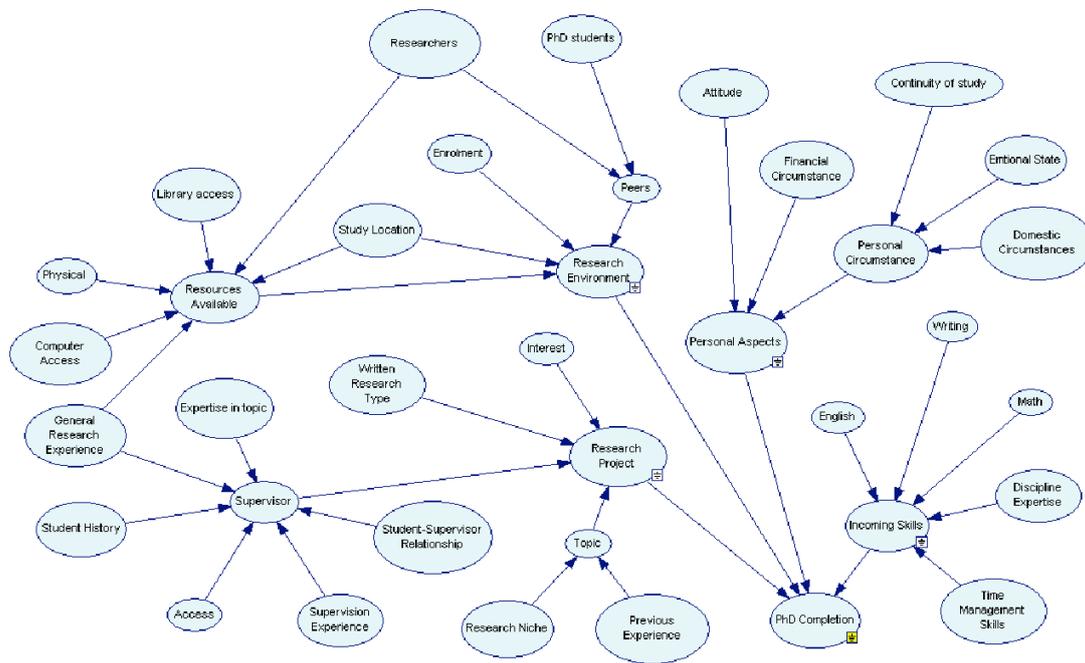


Figure 2: Factors affecting completion of PhD study.

In a study that examined doctoral experience across disciplines, empirically established factors were reviewed in a structured process (Sverdlík, Hall, McAlpine, & Hubbard, 2018). The contributing factors observed were classified as both external and internal in nature. The authors listed effective external factors were supervision, the students’ personal and social lives, university’s departmental support and socialization, as well as financial opportunities. Meanwhile, the internal factors were described as motivational variables as well as writing competencies and academic identity. It seems a positive between student and supervisor is one of decisive key in PhD completion as mentioned in a very recent report from Netherland (Rooij & Jansen, 2019). They pointed out that high workload is negatively related to satisfaction and progress and positively to quit intentions. Instead, the quality of the supervisor-PhD candidate relationship, the PhD candidate’s sense of belonging, the amount of freedom in the project, and working on a project closely related to the supervisor’s research were positively related to satisfaction and negatively to quit intentions. The supervisor-students key factor was also evaluated methodically by Ndayambaje (2018). The author revealed three supervision defects that hinder the timely completion of PhD for international students. These are (i) limited level of supervisor-supervisee interaction, (ii) inadequate technical guidance from supervisors and (iii) poor or delayed feedback from supervisors. Nonetheless, motivations for undertaking PhD, technical skills and opportunities for academic development play a major role in the PhD experience (Naylor, Chakravarti, & Baik, 2016). Probably the most comprehensive study ever taken on PhD programme would be by Council of Graduate Schools, U.S. which had been supported from Pfizer Inc. and the Ford Foundation. The study was a collaboration of 29 major

U.S. and Canadian research universities that took seven years to be completed. At the end of the cycle, monitoring, reporting and improving was successfully carried out when data has been assembled and utilised appropriately (CGS, 2010). Participating universities had been tasked to create intervention strategies and pilot projects, and to evaluate the impact of these projects on doctoral completion rates and attrition patterns. Another 25 partner universities participated in various parts in the project.

The Ph.D. Completion Project, as it was known, successfully published four volumes of monograph between 2008-2009 describing the baseline data, demographic of completion and attrition, exit surveys and recommendations on policies and practices. In its preliminary study, it was reported that 50% of those who had enrolled in doctoral degree program would complete their studies and most of them were male. As the project aims to improve completion and reduce attrition from Ph.D. programs, it has found that there are six categories of potential interventions to improve completion in and attrition rate PhD program; selection/matching and admission, mentoring and advising, financial support and structure, program environments, research experiences and, curricular and administrative processes and procedures. Apparently, 80% of successful doctoral candidates contribute their completion to availability of financial support. In addition, non-monetary support is also considered equally important as training, mentoring, family, and peer supports are placed second, third and fourth, contributing factors for successful completion by the graduates. Furthermore, in the final reports, the study suggests that in the first encounter, students-supervisor matching can be carried out by proper introduction to campus and faculty in organised open day besides an official website which are transparent and descriptive. As part of intervention activities, accommodating and facilitating environment should be provided in terms of resourceful libraries, complete research facilities and flexible parental services.

On the contrary, in 2013, the Higher Education Funding Council for England has published a report which states that the successful completion rate has increased slightly to 72.9 % in 2010-2011 from 70.1 % in 2009-2010 for those obtaining PhDs within seven years in UK or the EU (THE, 2013). While, during the same year, Canada scored 78.3% for those obtaining their PhDs in the health sciences within nine years (Charbonneau, 2013). Henceforth, there are many debates issued as an increase in PhD graduates is noted globally. The first issue to be debated is the doctorates. The Higher Education Academy of UK has produced a discussion paper which reports the involvement of key stakeholders to debate on these issues (Park, 2007). The intertwined issues revolve PhD programme and graduates are the purpose of doctorate, supply and funding, supervisor-student experience and nature of research and, quality and accountability (Brailsford, 2010; Jiranek, 2010; Spaulding & Rockinson-szapkiw, 2012).

In a local context, a study by Shariff, Abidin, Ramli, and Ahmad (2015) investigated the perceptions of PhD candidates at a Malaysian university regarding the predictors of timely PhD completion. They have focused on six predictors: institutional/organizational, research skill, research work, supervision, motivational and demotivational. Furthermore, research skills and guidance have been perceived as the most important factors. Apparently, in the Malaysian situation, postgraduate students are well taken care of by higher learning institutions (IHL). In contrast to other countries especially developed countries, fundamental research projects are well funded and mostly awarded to IHL (Academy of Sciences Malaysia, 2020). The funds would include allowance for graduate research assistants. Hence, the students would focus more on their research activities instead of working part-time to support their living and study expenses. After a few years of research activities and supervision, I have found that the most required research skills that should be acquired and polished from early on are reading, writing, and communicating. These skills would improve understanding through better content digestion, clear connections, and presentations. A good strategy would be to come up with at least an academic paper in a year.

Secondly, developing basic research skills such as computational, statistical, and technical skills which would facilitate research works. These skills will propel postgraduate students to better positions in the whole research strategy.

4. Surviving My PhD Journey

On a personal note, I would say that I am an average PhD achiever. More importantly, I think it is the journey that matters. Thus, I have made good plans by making sure that the family would not be so much affected especially the school going children. Of course, the husband's career was considered greatly so that the relationship is kept harmonious. Financially, I was considered the lucky ones since I was a scholarship holder and the salary was unaffected. Furthermore, my project was considered important that it had received substantial amount of money.

During the study, I lived on my own. The place was close to the campus, and I travelled around by bus. As I was studying medicinal chemistry, my scope of work involved working in three separate laboratories. It took determination and discipline to achieve the aims of my study while maintaining a long-distance relationship. Therefore, I had added in my PhD strategy to take care of myself by eating and exercising well. I believed it deeply that every aspect of my health needed to be strong to face challenges posed in PhD struggle.

My thesis was written in blood, sweat, tears and ash. Figure 3 below depicts the accident that occurred at our lab. It was one of the most horrifying episodes in my postgraduate studies. I have experienced bad incidents; crashed laptop, car accident, vengeful supervisor, you name it. But I will always remember the call from my lab mate. She said, 'Our lab has exploded.'. So did my heart, but time heals. I had some time to calm down and figure out my next step. It was not easy. Even though, I have lost my precious pure secondary metabolites, it was fortunate that I have completed their structural elucidation and anti-proliferative bioassays. I was actually in the middle of synthesising one of them, the canthin-6-one. The building that was burnt down, housed several very productive laboratories, thus, the management was very quick to provide new temporary space and fund to build new ones.

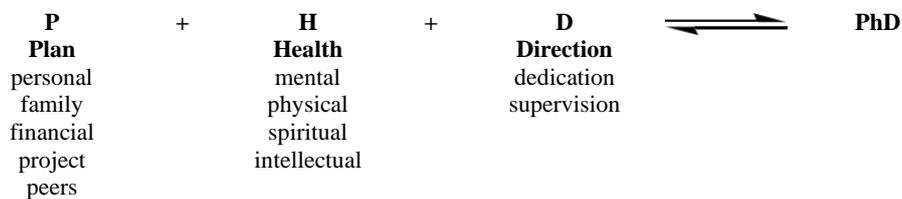


Figure 3: Our laboratory was on fire in 2013 (Mohd, 2013)

No matter what, surviving PhD study is no small feat despite all the planning, preparation, discipline, direction. Somehow, some way, something would come and give you a big test because PhD journey is a mountainous examination. Therefore, to overcome the hurdles, may it be personal or not, by intention or not, the only thing left to do is to persist by striving on. In addition, determination is required to maintain the drive as once it is gone, you would lose the motivation to fight.

5. The P, H and D

Professionally speaking, some basic factors would boost confidence and push you forward. Putting things in a more simplified perspective, the winning formula would be,



Scheme 2: Elaborated formula.

The best first step forward is to make a proper plan. A plan is an aim with objectives or strategies which indicate processes involving resources at hand. A good plan would clarify every milestone that must be achieved in every objective; hence, it should be both encompassing and detailed. The Plan element should consist of Personal and Project Strategic.

In Personal Strategy, it starts with YOU. It is vital for you to have an answer for the ‘why’, ‘what’, ‘how’, ‘where’ and ‘when’ questions. Once you have settled those questions then, you can embark on the PhD journey. The answers would involve details on matters regarding, most importantly, your intention (*niat*) in advancing your academic qualification. As something which carries greatest bearing, it requires some soul searching, deeply (pray a lot). The rest of the answers can roughly be differentiated into financial and non-financial supports. Agreeably, topmost influential concern would be financial means in terms of scholarships, research grants, fellowships, attachment, or mobility programmes, in general, funding sources that would ease you in carrying out your postgraduate program. ‘Money matters’, Financial stability in terms of fellowships or scholarships provide assurance that personal’s or family’s needs will be fulfilled and satisfied. In the course of research activities, STEM postgraduates’ students will be able to perform proper research activities without any worries. Other kinds of support that is non-financial are equally important. Support from family is the most important element that has to be acquired it would help to clear up obstacles by understanding need to have more time to focus in study, helping out in caring responsibilities and managing households. Another objective would be logistic, which consists of location, transportation, and mode of study. It may seem small detail, but it is important as it would ‘settle the dusts’ in a way of speaking. The Project Strategy would be more complicated and daunting as it needs more thoughts put in. It is the PhD research project, which would be undertaken, hence the requirement of in-depth study. Furthermore, The Project would determine the supervisor who is the key person in PhD completion. There is no secret tip on how to get a good supervisor as it is considered luck or *rezeki* when we do get one. Then again, may be ‘chemistry’ can show you the way.

The second element is Health. Before embarking on a PhD journey, a medical check-up should be prescribed, and boosters should be taken. All the quotients; intellectual, physical, mental, and spiritual should be in good condition. Expect the unexpected, PhD is a bumpy journey, so hang on tight! Your light at the end of tunnel would not be found unless you have experienced great turmoils in the PhD journey.

Lastly, it is the element of Direction. The Direction Strategy aims at gearing up for the study. PhD programme involves a lot of parties, the university, faculty, research centres and research groups. They are burdened with the responsibility of making sure that every PhD candidate complete the programme. The university has to provide proper and adequate policies in ensuring a capable and well-managed postgraduate centre. Subsequently, faculties and research centres would organise better supportive facilities. Eventually, research groups would receive beneficial advantages and exert positive thrust.

Noticeably, the PhD study involves both intrinsic and extrinsic motivations. Hence, the ability to compartmentalise in order to make better decision is highly recommended. Probably, that should best be left to the PhD candidates themselves. Besides, The Plan should have been constructed around a key concept which would determine the final aim. Thus, *to one to his own*. Henceforth, P also stands for patience and within lies perseverance as only with patience, an immense challenge can be overcome. It is a comfort to believe in a Quranic verse that says, 'In a hardship, there will be ease. 94:5'. Have faith that a liberating solution does exist. While, H may also mean heartfelt gratitude, even in predicaments. Finally, D for doa which is the key that unlocks the box of knowledge.

I believe that is the formula to a successful PhD journey.

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