Six project-management tips for your PhD
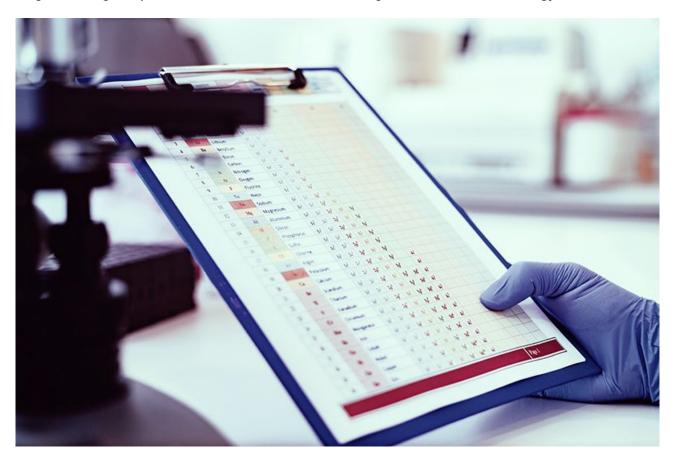
CAREER COLUMN
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Use strategies from the private sector to better manage your graduate project.
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One way to help manage your PhD is to create a list of specific outcomes that you expect to deliver in the course of your project.Credit: Getty

In my experience, a PhD project sometimes feels like it demands more time than is possible — especially if you were hoping to maintain a healthy work–life balance. In my view, every graduate-school curriculum should carry a course on project management.

I am a PhD candidate in bioengineering at the Georgia Institute of Technology in Atlanta, and, during my studies, I have developed project-management skills that might help others pursuing a PhD. Here are six pieces of advice that helped me (see also 'Further reading'). The strategies below follow a common idea: define the undefined.

Define your timeline

Start the academic semester with the end in mind. What would you like to accomplish by then? Begin each academic term by defining major milestones associated with your research project (for example, completing the first draft of a review article) and your graduate programme (for example, conducting a PhD-proposal defence).

Break down what actions you need to take to achieve each goal. At this point, you can assess the time commitment required, as well as existing hard deadlines, then prioritize each action item to fit within the time available for the semester.

Prepare to be 'punched in the mouth'

American boxer Mike Tyson once said "everyone has a plan until they get punched in the mouth". Unforeseeable events (such as a broken pipe in your laboratory or a change in deadlines from your supervisor) will affect your timeline. It is important to keep in mind that the projected path for your semester will need continuous readjustment. To account for the dynamic nature of a research project, I perform a mid-semester revision to assess overall progress and decide which aspects to prioritize. It is good practice to build margins into your schedule: overestimate the time required to complete a specific task. Margins will serve as a protective cushion against unpredictable events that threaten to thwart your progress.

Define your project scope

Your project scope should start with a clear statement of overall goals, followed by a list of specific things that you expect to deliver in the course of your project. This part can be simplified as a 'master to-do list' that, once all checked off, will indicate project completion.

Add value, not experiments

What is absolutely needed to maximize the value (or impact) of your project? When creating your master to-do list, reflect on what would bring the most value to your project. Once these elements have been identified, devote all your efforts to completing them to the best of your ability. As graduate students, we are sensitive to the double-edged sword of academic freedom and scientific curiosity. You should let your curiosity take the driver's seat in some cases, but do not use scientific curiosity to justify fishing expeditions outside your project scope. As a graduate student, you have limited time and, often, limited resources.

Define metrics of success

Well-defined metrics of success lead to small victories. What does success look like for each item on your master to-do list? Having these metrics in place helps to address whether you are moving in the right direction. Ideally, reaching each metric should provide a glimpse of the final product of your research project. I consider reaching each metric a small victory, and each provides a boost of confidence to keep moving forward.

Make progress by failing early

Failure is inherent to the research process, and fear of failure can damage your productivity by inducing what is known as analysis paralysis — the inaction that comes from overthinking what needs to be done to achieve one's goals. In my experience, analysis paralysis is hard to overcome when there is a lot at stake. To avoid this, design experiments that address small portions of your overarching research question and give you space to fail early — if you're wrong about a key assumption in your project design, you'll want to know as soon as possible. An early failure is a successful failure because it allows you to recalibrate and quickly address the shortcomings of your project.

These project-management strategies can help to introduce a degree of control over the uncertainty of graduate school. Moreover, they are often used outside academia for their proven ability to increase the probability of success. If they work for the private sector, they will work for your research project.

Further reading

Great at Work: How Top Performers Do Less, Work Better, and Achieve More by Morten T. Hansen (Simon & Schuster, 2018).

Project Management for the Unofficial Project Manager by Kory Kogon, Suzette Blakemore and James Wood (BenBella Books, 2015).

Failure: Why Science Is So Successful by Stuart Firestein (Oxford University Press, 2015).

The 7 Habits of Highly Effective People by Stephen R. Covey (Simon & Schuster, 2013).