Welcome to the Week One lesson How I Prepared for the MIT Challenge.

Success and Failure Start with a Plan

The MIT Challenge, as many of you know, was my public project to learn MIT's undergraduate computer science curriculum over one year. For anyone who’s interested in that, I have a TEDx talk on the subject as well as an extensive web page for the MIT Challenge explaining all of the elements of the project. Instead of recapping exactly what I did, I’d rather talk about assuming that you know what the MIT Challenge was how did I actually plan for it so that it would be successful?

I think even if you’re not trying to tackle a learning project as large or as tightly time constrained as the MIT Challenge, this is still valuable, because a lot of the things you're going to want to learn are going to be long-term projects. They're going to be things that are going to involve significant amounts of time, and they're going to be the kind of thing that you're going to be likely perhaps midway to give up or to lose interest in.

I want to talk about what actually went through in the preparation for this project so that I could actually stick through it and get it done.

The MIT Challenge, even though it was a yearlong project, it involved almost a year of planning. The first eight months of that were more on the concept, what exactly what I was going to do rather than actually planning how I was going to implement it. But I think it’s important to state that eight months as being important as well. This wasn’t an idea that I decided to do overnight. I had been incubating it for a while.

I think this is good, particularly for long projects that are going to consume a lot of your time to not rush into projects right way, especially if they’re going to be six, 12 months, those kind of projects. Rather, let them sit, percolate for a little bit and basically I feel like if the idea still appeals to you three months, six months later, then it’s something that’s worth investing in, versus if you forgot about it after a couple of weeks, that’s not something that occupies your attention, it’s probably not going to be something you’re going to be able to stick through for an entire year of hard work.

It was about eight months of thinking about the idea, deciding exactly what I was going to try to do, and then once I decided I wanted to do this undergraduate curriculum in a year, it was about four months of serious planning to actually get ready to do it.

Once I defined this idea, and I had figured out, “What was the idea exactly?” Originally the idea was that I was going to do the final exams for these courses. Obviously doing every single assignment, every single project was probably going to be too time consuming to be able to do it in a year. Instead I wanted to have an easier metric. I figure if I can pass the final exams and the classes are final exam classes, then that should be sufficient for saying I learned the course material.

Once I defined this goal, then I actually had to do the real planning. I started with defining the curriculum. What classes was I actually going to be taking? I had to investigate it, and there were lots of times where I had to make alterations where the original MIT undergraduate curriculum was not going to be possible. So how I
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could I approach it in a way that was fair? Making either substitutions, replacements for existing elements in the curriculum.

Next, I had to plan my schedule to fit it within this one-year period of time. You’ll remember from the main lesson for this week that I discussed that there’s two ways you can define a schedule or a deadline. One is you can decide what you want to accomplish and then fit it into that timeframe, or you can figure how much time you want to spend and decide how long it will take.

In this case, what I wanted to do was I wanted to fit it within one year, so I had to figure out, “How much work is that going to be?” Once I had planned out the broad schedule, I had to actually test it before I started. I had to know whether or not this schedule would actually work.

Finally, once the MIT Challenge started, I had to make changes as I went through the process.

I’m going to go through each of these four points real briefly so you can get a sense of what was involved in planning the MIT Challenge and although it was quite a different project, the Year Without English had quite a similar preparation approach, so I want to stress this isn’t something that’s merely for learning MIT's computer science curriculum, but it is something that is broadly applicable to whichever learning project you might want to undertake.

Defining the Curriculum and Materials

The first step was to figure out what were the curriculum and materials I was going to use. The basic idea, the original idea for using this was that MIT has what they call OpenCourseWare, which is where people take actual materials from real classes and upload them online so that other people can use them for free.

This is different from MOOCs. At the time when I was planning the challenge, there weren’t things like Coursera or EDx where people do sort of university classes, but they’ve been designed specifically for an online platform. In many cases, they don’t actually reflect the difficulty or the rigor of the original course.

In this case, I knew that wasn’t going to be a problem because these were materials that were used in MIT’s offline classes. They weren’t modified, they were uploaded as-is. This can be good for doing some courses, but there were some issues.

One example is that lab or heavily project-based classes were often missing from OpenCourseWare, or they were there, but they were impossible to do. For instance, the class assignments might involve working with a particular robot that I don’t have access to or with a particular piece of software that wasn't provided.

Humanities requirements were also lacking. Any graded criteria, they didn't have final exams, so that was also an issue. MIT has a quite, their standard undergraduate curriculum includes not only requiring you to take courses from the general sciences — chemistry, physics, math — those subjects, regardless of what you study, but they also have humanities requirements, and this was a real problem. Even though humanities classes sometimes are easier than, let’s say, differential equations, if they don’t have final exams or they’re only graded by essays, there’s not much I can do. I can’t grade myself for those classes.
Finally I couldn’t do a thesis project. That was one of the requirements for MIT’s curriculum was that all undergrads do a thesis project at the end of their year. Obviously this was a project that I couldn’t undertake myself, because it’s something that requires collaboration with a particular mentor or a professor and in the grading and the defense of the thesis. Interestingly, I did do something that was a mini project of creating a Scrabble AI at the end, but I wasn’t considering this officially part of the MIT Challenge, and it wasn’t something that I gave myself a grade over or said it was comparable to an MIT thesis project.

And some classes simply had no OpenCourseWare files. There were some classes that I knew that I needed to take, but they didn’t have an OpenCourseWare representation. What was I going to do about that?

These are some complications that a lot of people who have considered taking the MIT Challenge have said to me, “I wanted to do the MIT Challenge, but I couldn’t find all the classes or I couldn’t figure out the curriculum.” This is what the planning was for. This was a lot of work to figure out how do I make this OpenCourseWare thing work. I think this is something that a lot of people don’t spend enough time on when they’re doing self-education projects.

They figure, “I should be able to start learning immediately.” Whereas if you’re taking on a big project, very often you have to spend time planning out how you’re going to learn, and that Isn’t a trivial amount of work. It may take you, in my case it probably took dozens of hours to prepare this.

The solution was to make workarounds. For the lab and project-based classes, I would try to substitute them for more theoretical classes, classes that actually had final exams and more material. For the humanities, I decided to substitute economics classes, even though they’re not strictly the classes that would have fulfilled all of the requirements of the humanities. I fudged it a little bit because otherwise the project wasn’t going to be possible.

I omitted the thesis project. I simply didn’t do one. And then finally for the classes that didn’t have an OpenCourseWare representation but were required, most of the time what I would do is I would either see if there was some OpenCourseWare representation even if it was pretty sparse. One class I remember doing it only had slideshows. It didn’t have videos, it didn’t have a textbook, it didn’t even have lecture notes that were written out, it just had slideshows and that was how I had to teach myself the class.

For other classes, I made use of MIT’s private classes, so I actually had a contact inside at MIT who if I needed help finding extra material I could ask them and this person using their MIT credentials could go into MIT’s actual course website for MIT students and download and give me materials if I needed extra final exams or what have you. This is something obviously for some of these classes where I did use those final exams I wasn’t able to post them online because they’re not freely distributable, but it was a way I could get around working.

This is important. I think it’s clear there was a lot of creativity, and it wasn’t automatic how to deal with these situations. When you’re doing your own learning project, you’re going to face similar issues. Maybe not with the curriculum itself, per se, but maybe with what materials you’re going to use, how you’re going to enforce self testing and active learning, and I want to stress it’s up to you to be creative at finding workarounds.
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In many cases, even if I did have a class, it was an OpenCourseWare I didn’t have complete material. I might not have lecture videos, I might have to learn from a textbook, and in many cases this was OK. It didn’t actually create a significant impediment. It is worth noting it wasn’t as if every single class I had had all the lecture videos, had perfect notes, had perfect materials. It was a lot of creativity to make things work.

Picking a Schedule

Let’s say now I’ve actually picked the classes that I’ve worked out, and after my adjustments, I have 33 classes to complete in the one year period of time.

Basic math says that’s a little over one week per class for completion. Fifty-two weeks in a year, 33 classes, I maybe have a week and a half to do each class.

I figured there are going to be delays. There’s going to be the possibility that difficulties can increase. I might get burned out. I might need to take a vacation. How am I going to deal with that?

Instead of saying, “I’m going to spend a week and a half on each class, which if nothing goes wrong, I'll finish in a year,” I decided to set a more intense schedule in the beginning. My initial goal was to complete one class per week, and if I sustained this over the entire project of one class per week, which would have been probably too difficult. I don’t think I would have been able to actually do that. Let’s say that I had set that as my goal to do that in one week, that would have meant that I would have finished the entire MIT Challenge in 33 weeks as opposed to 52 weeks.

Now the question is, can I actually complete a class in a week? Is this a reasonable estimate? Assuming I can complete a class in a week, how am I actually going to do it?

I have to plan this out. I figured that I'm going to need every single week, I'm going to need at least one day off each week to relax. Considering this is a project that’s going on for a year, if I study nonstop that’s not going to be good for my long-term productivity, so I want one day that I can relax. And I also want one workday. In addition to doing the MIT Challenge, I have a blog, a business that I need to run. When I'm not doing new projects, when I'm not doing lots of new stuff, there isn’t tons of new work. I am able to fit it into a small period of time. That is an advantage that I had over people who are working a full-time job, let’s say. But I do still need some time for working. I also set aside one day for working. That not only involves writing blog articles and keeping customer service and doing all of that, but it also involves me having to scan and upload my exam results for classes I've passed. Recording weekly vlogs on YouTube explaining my MIT Challenge progress. There was quite a bit of stuff to do that day.

That gives me five days left over. How much studying can I do in those five days?

I planned in the beginning to work from about 7 a.m. until 6 p.m. with small breaks taken when needed. That doesn’t mean that I’m not taking any breaks, but that I would take the breaks when I needed them rather than them being scheduled in advance.
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This was not dictated from the idea of “I need 55 hours to do a class in a week,” but rather it was, “This is how much I think I can reasonably sustain as a studying schedule over a year,” and that worked out to be about 55 hours a week. The question now was, “Does this studying schedule of studying 55 hours a week, will it actually work for being able to pass a class?”

Testing the Schedule

I decided to test the class on one of the MIT Challenge classes, 801 Physics, before moving forward with the full commitment.

I stuck with that schedule that I just described and despite the difficulty I did manage to get past the class with about 75 percent. It was hard. I don’t want to make it sound like it was a breeze, because it was a hard class. But I was able to pass. It did give me the sense that even though this was going to be difficult I got a sense of what I was getting myself into.

This reduced the MIT Challenge classes to 32, so it means that I got one out of the way before the yearlong period, and it convinced me that I could tackle the rest of the program at that pace. I felt after doing that one week period of time, I said, “This is going to be a lot of work, it’s going to be tiring, but I think that I can actually do this.” And again, this is also based on the idea that this is a slightly faster than normal pace. If it had been the case that I needed to finish it if I was doing 52 classes, let’s say, and I needed to do one per week, I maybe wouldn’t have been so convinced, because I knew how difficult it was. Instead in my head it was like, “It’s going to be difficult, but this is the hardest I’m going to have to go in my perception of things rather than the easiest.”

In reality, though, when I was planning and did this testing, I was a bit lucky, and I was lucky that physics, despite having a lot of material — meaning that it had video lectures, lots of assignments, lots of practice questions — was actually one of the harder classes for me to learn quickly. I found that both Physics I and Physics II were fairly difficult to do in such a short period of time, as were some of the early math classes, but the later computer science classes, I actually found them easier. They were classes that I was able to do with less studying time.

This meant that even though I had picked a class that was leaning toward the hard side on average, I couldn’t have known that in advance, but I was a bit lucky. If I had picked a class that was easy, it maybe would have thrown off my planning.

Finally I overestimated my ability to sustain that schedule. Although I figured in my head that 55 hours a week I’d be able to sustain it, I was only able to keep it going for about 10 weeks, and then after that I started falling more toward 30 to 40 hours. So I would wake up and start studying around 8, later in the challenge maybe at 9, and I would only go until about 5 p.m. So I’d be cutting the hours, and that meant that I was doing less studying per week.

The advantage of this is that all of these factors worked out so that while I was getting into the later parts of the challenge, I was confident I would finish on time. There wasn’t a worry in my mind that I wouldn’t finish, so
even if I had to do more classes, I think I could have still fit them in. I was lucky that the planning worked out that way.

Adapting the Plan

One of my favorite quotes about planning is that plans are useless but planning is invaluable.

This is something I think is important keeping in line with the MIT Challenge that I did do a lot of planning, however once the MIT Challenge actually started, a lot of those plans changed or were adjusted. But that doesn't mean that the planning phase didn't enable the success of the project. By doing the planning phase I fully thought through a lot of the issues that might come up with the MIT Challenge. I thought through the curriculum. I explored a lot of issues in advance, so when problems did come up, even if they were new problems, I was able to get through them, whereas if I hadn't done that planning, I'm not sure whether I would have been able to.

Immediately after announcing the challenge I realized that the public perception of the project, which originally I was thinking, “If I do final exams that'll be good,” was that the only reason to do a computer science degree was to be able to practice programming. A lot of people had that perception that if you are studying computer science, you're necessarily doing it to learn programming.

This is a little bit misleading. I think particularly in the MIT case where their computer science degree actually doesn't do that much programming. It's more math classes and theoretical classes. Computer science being more like a branch of mathematics rather than an applied class in doing programming. I realized that if I didn't do any programming projects, a lot of people were going to raise some eyebrows about that, and about 10 of the 32 classes had some programming projects in them. So I decided, “I'm also going to do the programming projects.”

This completely changed my planning, completely changed a lot of my schedule, but because I had done all of that planning, I was able to have some confidence that I could fit it in.

I changed and added the programming projects as a requirement. In practice, this was good. It enabled me to learn some programming. I didn't find that it delayed, even for the classes that had quite large programming assignments, the challenge significantly, but it's something that could have undermined my research. If I had found out, “I'm going to be cutting the wire working as hard as I possibly can,” there was no flexibility, then it might not have been possible to add the programming projects, or adding them could have wrecked the challenge.

I worked at my one week per class schedule for about three months and then after about 10 classes I started working on about three to five in parallel. I also slowed the pace somewhat doing about three classes every four weeks. This would continue until later in the challenge when some classes I was taking two weeks or two and a half weeks to do one class if it had a lot of programming projects. I think this is important to keep in mind, because obviously there’s a discrepancy between what I planned and what actually happened, but I still feel that the planning was valuable for getting it done.
Applying This to Your Project

I think there are a couple of lessons you can draw from this experience and apply to your project. Whether you're trying to tackle an ambitious, multi-year project that you're working on full-time, or whether you want to learn something a couple of hours each week in your spare time.

1) Thorough planning is useful.

Planning is useful not only for being able to deal with difficult curriculums, scheduling your time, knowing what you can actually do in a reasonable timeframe. But it's also useful, because it forces you to think about what you're committing to. People who don't do that much planning, I find, don't have strong commitments, because they don't know what they're committing to. When you fully plan out the project, then you're much more likely to commit to it, because you imagine in your head what's going to be required to finish it.

2) Test ambitious plans with a pilot week.

A pilot week is a one-week period of time where you're going to test run the actual curriculum. You're going to test it out and figure out what is working and what's not working. If you're working on an ambitious plan that you're not sure going to be able to stick with, doing the pilot week will be able to tell you whether or not that's useful before you make a full commitment.

3) Changes are inevitable, but don’t remove the need for planning.

You can see that I made a lot of changes once the MIT Challenge actually started, but that even despite these changes, they didn't remove the need for me to do this planning.

4) Expect to lose momentum over time. Plan for it.

Expect that as you get further into the project, you're going to get more tired, stuff in life is going to come up, you're going to have less enthusiasm, you're not going be able to work as hard, as fast or as efficiently, and plan for this.

I did this by testing a one week schedule that was more ambitious than necessary to finish it over a year, and what happened is I did get tired, I did have a hard time sticking to a schedule, so when I was in month eight or nine of the project, I was on time rather than being terribly late.

5) Don’t be afraid to try something new or ambitious!

I know I've stressed taking these projects seriously and not being flippant about them, but I think it's also important to point out that this was an exciting process for me in planning out this project. It was something I really wanted to learn. It was something I thought would stretch myself of pushing me to do new things and test my intellectual limits, my productivity limits. If it was successful, which it was, it could be a real example in my life which I could use to guide further projects.
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Don’t be afraid to try these things. I think if you apply this approach, you can tackle ambitious projects and you can tackle them aggressively. The reason most people fail when they start these kinds of projects is simply because they don’t do this planning process. They run into it thinking, “I’ll figure it out when the time comes.” But what happens is a couple of weeks later they get tired and something comes up and they say, “Ah, forget it.”

Whereas if you’ve done this planning process and you’ve seen what’s going to be required, when something comes up, you’re going to say, “I knew this was going to happen. Let’s move forward.”

I hope this helps you start your own dream learning projects. Maybe you’re not going to start the MIT Challenge or the Year Without English, but I hope that you are going to start your own learning projects to learn something that excites you, that’s going to help you in your career or your studies. I hope that hearing a little bit about how I prepared for the MIT Challenge helps you with that. Thank you.