

## Episode 10: NSF Graduate Student Mentoring Plan and IDP Requirements

Welcome to Grad-Post! I'm your host, Brian S. Mitchell, and we're here to talk about life before, during, and after graduate school, and whether an advanced degree is right for you. I'll draw upon my experiences as a graduate dean and research mentor, as well as my network of students, colleagues, and experts to bring you the most complete information on graduate education that I can.

This is part two of a two-part podcast on Individual Development Plans or IDPs. Episode 9 was devoted to IDPs from the graduate student perspective: what they are, how to use them, and how they can benefit the student. As I mentioned in that episode, IDPs are electronic documents that help graduate students think about their scholarly, artistic, and research training while they are doing them, and how their activities can be tailored to meet their career goals. In this episode, we'll focus on how IDPs are used by research advisors and university administrators to meet federal funding agency requirements and how they work in conjunction with the related mentoring plan requirements to provide professional development training for graduate students and postdoctoral scholars. Warning: things will get a little jargony and some of you may find this overly STEM-centric. But even if you're in the humanities, business, or fine arts, you already have disciplinary equivalents and in all honesty much of what we'll be describing today started in arts with their portfolio management tools and the business community with performance reviews and personal development plans. Hopefully, you'll recognize how - like those practices - IDPs and mentoring plans can actually be a benefit to not just to advisees but to their mentors as well. Let's start with some background on funding agencies for the uninitiated.

Two of the largest and most influential research funding agencies in the United States in terms of open-access, public research are the National Institutes of Health (NIH) and the National Science Foundation (NSF). They are the chief funders of graduate student and postdoctoral researchers in the health sciences and STEM fields – including economics and sociology – through research assistantships associated with research projects, training grants, and research centers. Both have implemented some type of mandate for providing a career development plan for young scholars funded through these research activities. Though the terminology differs a bit between the two agencies, the purpose of these plans is ostensibly the same: to ensure that early career scholars are receiving instruction in not just the technical aspects of their program, but the career development aspects as well. Not to be too cynical about the motivation of legislators who ultimately tell these agencies what to do, but there's a hefty component of national security and workforce development - code for "future taxpayers" - in the bills that led to some of the legislative mandates we'll discuss today. But it's also true that these requirements for career mentoring and planning come from the education and psychology communities and are seen as best practices, so there's some pedagogical basis for them. Let's first look at how NIH has handled career mentoring.

Most of NIH's training grants to universities come through the Graduate Medical Education and General Medical Sciences divisions, known as "institutes" (hence, the plural in NIH). Many years ago, NIH established an IDP requirement in both the grant application review and the annual report certification processes. Training program grant applications and supplemental funding requests require up to three distinctly separate documents related to students: a research training plan; a mentoring plan; and a career development plan. These documents outline training activities at all levels of student interaction for which funds are being requested ranging from primary education students through postdoctoral fellows. The mentoring plan specifically calls for a description of how the student will be mentored; that is, co-mentorship, team mentoring or the like, and how the activities foster skills and contribute to competitiveness of the candidate in the biomedical workforce. The use of IDPs is specifically mentioned in the career development plan. As we will discuss in more detail, mentoring plans and IDPs are not the same thing – but they are related and should complement one another. In addition to these grant application and reporting requirements, NIH also offers a series of online career development tools for trainees through the [Office of Intramural Training and Education](#). These program requirements and training tools are fairly well-established in the community, so I won't go into more detail because those who get their funding through NIH already know how to include IDPs and related activities into their grant applications and training activities. It's sufficient to say that NIH has been at this career development business a long time.

The National Science Foundation (NSF) is where the use of mentoring plans and IDPs is news to some researchers. Mentoring plans were first [required for postdoctoral scholars in 2007](#) for any NSF proposal requesting funds to support them. I remember that there was much consternation in the research community at the time that this was an unfunded

mandate that would cause undue burden on the principal investigators. More on that in a moment, but some 15+ years later the world has not stopped revolving as many of the naysayers predicted. In fact, mentoring plans have become standard practice to the point that their use is now expanding to other trainees, specifically, graduate students. As of May 20, 2024, NSF has expanded the Mentoring Plan requirement to include graduate students for which funding is being requested. The [section of the most recent Grant Proposal Guide](#) (exactly what it sounds like) addressing this new expanded requirement reads in part (edited for relevance):

*“... each proposal that requests funding to support postdoctoral scholars or graduate students must upload under ‘Mentoring Plan’ ... a description of the mentoring activities that will be provided for such individuals. In no more than one page, the mentoring plan must describe the mentoring that will be provided to all postdoctoral scholars or graduate students supported by the project. Mentoring activities provided to postdoctoral scholars or graduate students supported on the project will be evaluated under the Broader Impacts review criterion.”*

A couple of important points here. First, the Mentoring Plan is limited to one page. One could question the effectiveness of such plans if they lack specificity, but at least the administrative burden part is limited. Second, the effectiveness of these plans is part of the Broader Impacts review criterion. The other review criterion is Scientific Merit. We don’t have time to go into these review criteria today in detail, but those of you who write and administer these grants know what they are, and if you’ve never served on a review panel, you really should. You don’t want your proposal to be technically sound but fall into the “Do Not Fund” category just because of a poor mentoring plan, so it does carry some level of importance.

So, what are some of the activities that go into a Mentoring Plan? Again, the Grant Proposal Guide reads:

*“Examples of mentoring activities include but are not limited to: career counseling; training in preparation of proposals, publications and presentations; guidance on ways to improve teaching and mentoring skills; guidance on how to effectively collaborate with researchers from diverse backgrounds and disciplinary areas; and training in responsible professional practices.”*

Many progressive programs will already have some of these activities in place, and there are even some universities where professional development training programs in these categories are routinely offered or even required by the graduate school. In general, institutions have developed boiler plate language that describes their specific institutional activities and resources that help investigators develop effective Mentoring Plans. Again, one could question that commitment to professional development training if boiler plate language is used, but there is benefit in showing that excellence in mentoring has been institutionalized and is valued by the administration. More on specific activities in a moment.

Before moving on, it’s important to note that the Mentoring Plan requirement comes directly from federal legislation, specifically, the [America COMPETES Act reauthorization of 2022](#). The relevant portion of this legislation [42 USC 18993 Sec. 10313 Graduate STEM Education (a) Mentoring and Professional Development] reads:

*“... the (COMPETES ACT) is amended by inserting “and graduate student” after “postdoctoral”; and inserting “The requirement may be satisfied by providing such individuals with access to mentors, including individuals not listed on the award.”*

I include this just to prove the point that NIH and NSF are not just making things up to make it more difficult to write proposals.

You may be asking yourself what any of this legislation or mandated mentoring plans have to do with IDPs. Sure, IDPs are tools that can be used to promote effective mentoring, but nothing in either the NSF or COMPETES Act language specifically requires their use. Well, the use of IDPs is specifically required in a separate section from the Mentoring Plan. Again, from the Grant Proposal Guide, Chapter VII.B.7:

*“In accordance with ... the CHIPS and Science Act of 2022, for each NSF award that provides substantial support to postdoctoral scholars and graduate students, each individual must have an Individual Development Plan, which is updated annually, that maps the educational goals, career exploration, and professional development of the individual.*

*NSF defines “substantial support” as an individual that has received one person month or more during the annual reporting period under the NSF award.”*

Note that the IDP requirement came from separate legislation, namely, the [CHIPS Act of 2022](#), which reads:

*“... annual project reports for awards that support graduate students and postdoctoral scholars include certification by the principal investigator that each graduate student and postdoctoral scholar receiving substantial support from such award, as determined by has developed and annually updated an individual development plan to map educational goals, career exploration, and professional development.”*

I encourage you to go to the text of this legislation in particular because there is also some language in the act that provides new and continued funding for graduate education, including supplements to research grants and research on graduate student mental health and wellbeing. More on this in later podcasts! But insofar as mandated IDPs are concerned, this requirement only states that the PI **certify** that such plans are being used and updated annually. It does not stipulate what an IDP actually must include nor how it must be used. The savvy PI, however, will make a connection to the Mentoring Plan through educational goals, career exploration, and professional development. Those words should be used in the Mentoring Plan to make that connection. Again, many of these activities are already available on campuses, either at the department, school and college, or institutional level.

There is evidence in the literature that IDPs and attention to mentoring make a difference in the development of scholars. I won't go through all that literature here. But, if you want just one document to bone up on best practices in mentoring, I refer you to a report generated by our venerable colleagues from the National Academies of Science, Engineering, and Medicine entitled “The Science of Effective Mentorship in STEMM” (that's with two “Ms”) (National Academies of Sciences, 2019).

You might be asking why these requirements weren't instituted sooner given the clear benefits to not only the mentor and mentee, but the research communities in which they work more generally. That's a great question. The answer is often given as either “administrative burden” or “unfunded mandate.” Yes, unfunded mandates rear their ugly heads even in academic research. The argument is that it takes additional time to prepare the necessary documents to meet the mandate, and the principal investigator actually runs the risk of a proposal being rejected outright prior to review if all the necessary documents are not there – including mentoring plans. Or that a poor mentoring plan gets poorly reviewed under the Broader Impacts criterion and what might otherwise be sound science is not funded. Similar complaints were made about similar documents like the data management plan – how research data would be stored and preserved, either for public access or audits. But these are now standard documents that unfortunately arose in part out of poorly managed grants.

As a PI, I saw the benefits of having such plans so it didn't bother me that I had to prepare and submit them. As a research and graduate education administrator, I had little patience for faculty who were hesitant to comply, not because I necessarily disagreed with the administrative burden or unfunded mandate arguments, but for pragmatic reasons. In the time we took discussing the need for such documents and what might happen if they weren't submitted, we could have just filled them out. I had similar frustrations with faculty colleagues about the truckloads of documents that were required for university accreditation. We had meeting after meeting after meeting discussing how burdensome it was to comply with these accreditation requirements, taking far more time to justify compliance than the compliance itself took. It's the same here – whether you see the benefit of mentoring plans or not – and I don't know why you wouldn't if you read the NASEM report – it takes less time to just do it. OK, that's the end of my editorial rant.

There is a legitimate concern about compliance verification, however. This responsibility typically falls on the chief research officer of the institution. It could be a Vice President or Vice Chancellor, it might be someone whose portfolio includes technology development and tech transfer, or it could even be someone in the legal or general counsel's office. But let's just call them the Chief Research Officer for now, or CRO for short. They will usually handle all aspects of research compliance, from what's called responsible conduct of research (RCR) training of all students, faculty, and staff, to research ethics and oversight of research infrastructure. This can be a huge job, especially if the institution is involved in animal research in any way – even worms. This is the person the federal agencies go to if there is a problem like alleged research misconduct or a routine audit of federal grants. That audit can cover just about anything, including non-fiduciary

requirements like archiving of research data, lab safety, and research training. Presumably, the federal requirement of individual development plans would somehow involve this CRO since they would be the ones responsible for demonstration of compliance if necessary. They may delegate this work to someone in the graduate school, or even all the way down to the departments and programs, but it still represents additional work that their office must perform. The bigger issue, however, is what constitutes compliance. Take for example, a program that has been using their own IDPs for the past ten years. Faculty and staff are trained by an outside consultant, the plans are filled out and utilized online using a tool developed by their disciplinary society, and they store annual documentation of review in spreadsheets in the cloud. All great practices! They were way ahead of their time. Now, the CRO has to implement a different, third-party software so they can document mentoring plans for the entire university. Is this ahead-of-their-time program supposed to switch? Unfortunately, the answer is probably “yes.” Will they have to substantially alter what they are doing from mentoring, research training and career development standpoints? Probably not.

There are still the typical questions of who and what activities specifically require a mentoring plan. For example, graduate students routinely go on and off of federally-funded grants, even several times within an academic year. Or, they may have only a portion of the financial support from the grant with the rest coming from a university fellowship, for example. Are mentoring plans required for a student who gets 25% of their annual stipend from a grant? For the IDP requirement, any trainee receiving one person month or more in an annual reporting period is required to have an IDP. But for the Mentoring Plan requirement, NSF program officers will tell you “check with your CRO,” which is a typical response for these types of things. It’s a very unsatisfying answer because everyone from the CRO down to the graduate student simply wants to know what they are supposed to do. The agencies have been loathe to dictate requirements to this level of specificity, however, and for good reason. Universities like doing things their own ways. Though this attitude can lead to some pretty poor practices becoming engrained in university culture – “That’s the way we’ve always done it ...”, it can in theory also lead to innovation, as in the program with well-established mentoring practices I mentioned earlier. There’s nothing fundamentally wrong with the “Tell me what you do and prove that you do it” approach to this type of compliance. But it can lead to non-uniformity which can be difficult to manage.

Which brings us finally to activities that might appear in a Mentoring Plan. Why not just take some of the recommendations from the NASEM report on mentoring? In addition to utilizing the IDP – which is kind of a no-brainer given that it is required – mentoring tools include guided discussions, mentor maps and mentoring compacts. Mentorship could include someone from outside the department or program to assist with non-technical aspects of career development. There should be evidence that these activities are rewarded by the university. Is it part of promotion and tenure review? Are there mentorship awards given by the university? Describe processes and procedures that may be in place to mitigate negative mentoring experiences by your trainees. There are also responsibilities of the mentees. Be sure to describe what these are and how students learn to be effective mentees and eventually effective mentors of their own. There is value in all of these activities – not just to your students but to you, the advisor.

I hope I’ve demystified this “new” graduate student Mentoring Plan requirement at NSF for some of you, and for the rest of you helped put it in context with career development activities that have been going on for some time now. Just to bring this topic full-circle, I invited those of you in the non-STEM fields to stay tuned. It turns out that there are IDP-like tools available online like [Imagine PhD](#) for the humanities and social sciences. In the business community, the Association to Advance Collegiate Schools of Business (AACSB) calls them “[career portfolios](#).” These are all the same concept.

Thank you for joining me today. All of the links referred to in this podcast are available on my website at [grad-post.com](#). There you’ll find additional podcasts and resources to help you plan your adventure for an advanced degree. The degree to which you view mentoring plans and IDPs as burdens or best practices impacts how effective they can be. For this reason, every degree counts.

## Links

Individual Development Plans, National Institutes of Health,

<https://www.nigms.nih.gov/training/strategicplanimplementationblueprint/Pages/IndividualDevelopmentPlans.aspx>

Mentoring Plan Requirements, Grant Proposal Guide 24-1, National Science Foundation, <https://new.nsf.gov/policies/pappg/24-1/ch-2-proposal-preparation#ch2D2i-i>

America COMPETES Act 2022 <https://www.govinfo.gov/content/pkg/PLAW-117publ167/pdf/PLAW-117publ167.pdf>

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CHIPS Act of 2022

Imagine PhD, <https://www.imaginephd.com/>

AACSB <https://www.aacsb.edu/insights/articles/2017/04/12-professional-development-tips-for-mba-students-from-coursework-to-workplace>

*National Academies of Sciences, E., and Medicine. (2019). The science of effective mentorship in STEMM.*