

Chapter 4 – Physicists who were Self-Employed

This profile is based on the responses from 29 mid-career physicists who reported that they were self-employed at the time of the PhD Plus 10 Study. Many of these physicists worked by themselves, often as consultants. However, many founded or co-founded small companies and supervised or collaborated with other employees. A small number of entrepreneurs who founded businesses that grew quite large did not classify themselves as self-employed and were not included in this chapter.

Job titles

Table 4.1 lists common job titles of mid-career physicists who referred to themselves as self-employed 10 to 15 years after earning their physics PhDs.

Table 4.1: Common Job Titles of Physicists in the Private Sector as Self-Employed, 2011
Consultant
Chief Executive Officer
President
Manager
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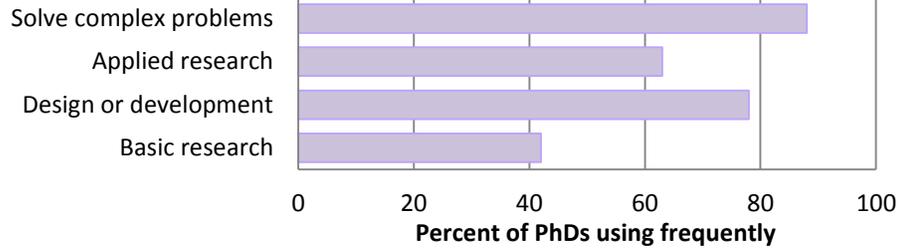
Job duties

Many of the self-employed were responsible for most or all of the administrative needs of their businesses. The products and services offered by the self-employed were closely linked to their scientific expertise and served specific niches within the STEM enterprise, with a few exceptions.⁴ Of several consulting companies founded by physicists, specializations included developing computing software for neutrino astrophysics, designing life science instrumentation, and improving inhalation exposure equipment for those working with infectious diseases. Some mid-career physicists who were self-employed were contracted to provide research & development, as well as analysis in various subfields.

Other self-employed physics PhDs founded their own small firms specializing in product design and in a few cases manufactured their own products. One new company founded by a self-employed physicist advocated for and advised scientists through major career steps like getting published and submitting proposals for funding. Physics PhDs also went into business for themselves as software engineers.

⁴ A custom furniture maker, a photographer, and one who carried on the family business.

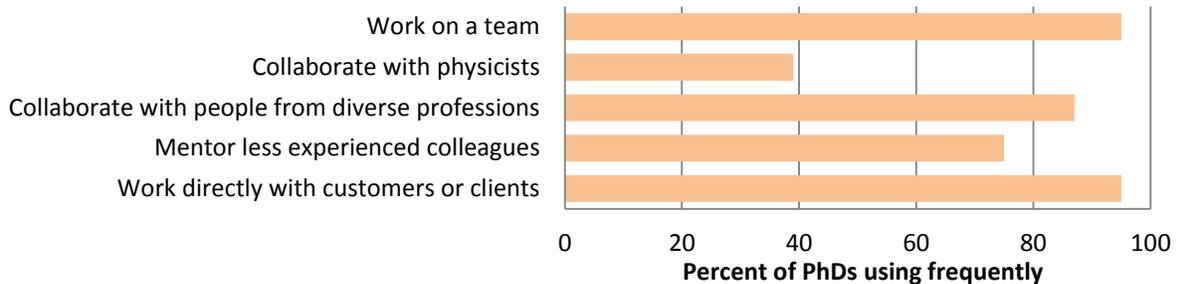
Figure 4.1: Cognitive Skills Used Frequently by Physicists Working as Self-Employed



“Frequently” combines response of “daily”, “weekly”, and “monthly” from a 5-point scale to the question “How often do you use the following in your current job?” Data include US-educated physicists who earned their PhDs 10-15 years earlier, who were working in the US in 2011, and who were self-employed.

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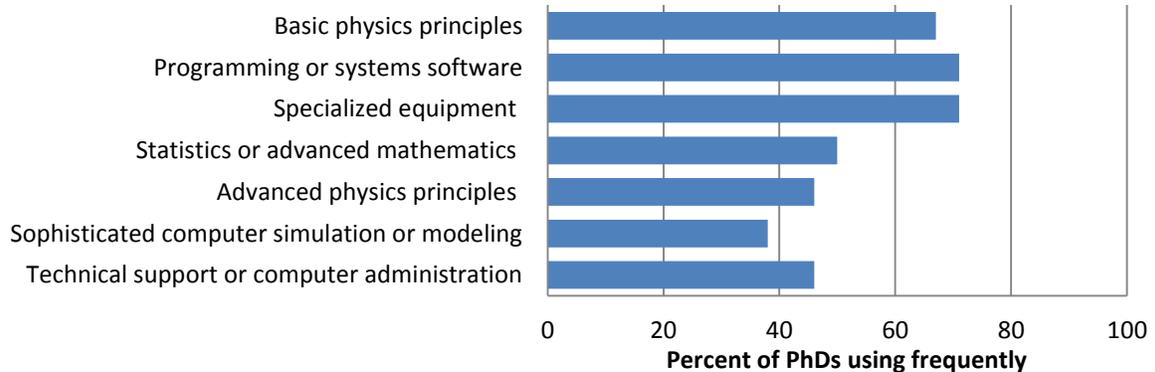
Figure 4.2: Interpersonal Skills Used Frequently by Physicists Working as Self-Employed



“Frequently” combines response of “daily”, “weekly”, and “monthly” from a 5-point scale to the question “How often do you use the following in your current job?” Data include US-educated physicists who earned their PhDs 10-15 years earlier, who were working in the US in 2011, and who were self-employed.

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Figure 4.3: Scientific and Technical Knowledge Used Frequently by Physicists Working as Self-Employed



“Frequently” combines response of “daily”, “weekly”, and “monthly” from a 5-point scale to the question “How often do you use the following in your current job?” Data include US-educated physicists who earned their PhDs 10-15 years earlier, who were working in the US in 2011, and who were self-employed.

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Knowledge and skills used on the job

PhDs who worked *for* themselves did not work *by* themselves. Nearly all of the self-employed PhDs were working on a team and working directly with clients or customers (Figure 4.2). Nearly 90% reported that they frequently collaborated with people from diverse professions, and quite a few reported that they regularly mentored less experienced colleagues. A significant percent reported that they frequently solved complex problems or engaged in design and development (Figure 4.1).

Mid-career physicists who were self-employed relied on knowledge from a variety of scientific and technical fields (Figure 4.3). Many reported frequently using knowledge of programming or systems software, and they frequently used specialized equipment. More than two-thirds frequently used their knowledge of basic physics.

The administrative and managerial demands on self-employed physicists are quantified in Figure 4.4. Nearly all reported that they frequently managed projects and over 80% managed budgets and finances, and nearly as many reported that they regularly managed people.

Communication skills are very important for self-employed physicists (Figure 4.5). Mid-career physicists especially needed to be able to write well for technical audiences. They also regularly contributed toward proposals intended to acquire new business as well as write for non-technical audiences.

Most rewarding aspects of their jobs

Self-employed physicists wrote about the aspects of their work that they found to be most rewarding. The following were the most commonly cited themes in the verbatim comments that self-employed physicists shared with us:

- They thrived on the fact that their efforts directly impacted the success of their businesses.
- They delighted in the intellectual challenge of solving a variety of problems, often in collaborative teams comprised of talented individuals.
- They enjoyed the freedom and autonomy of being self-employed. They enjoyed having authority over which projects to pursue and how to invest their efforts. While work could be time-intensive, many of the self-employed had flexibility over their schedules to balance work with their personal or family lives.
- A few self-employed physicists took great pride in the real-world impact their work had for their clients or the larger community.

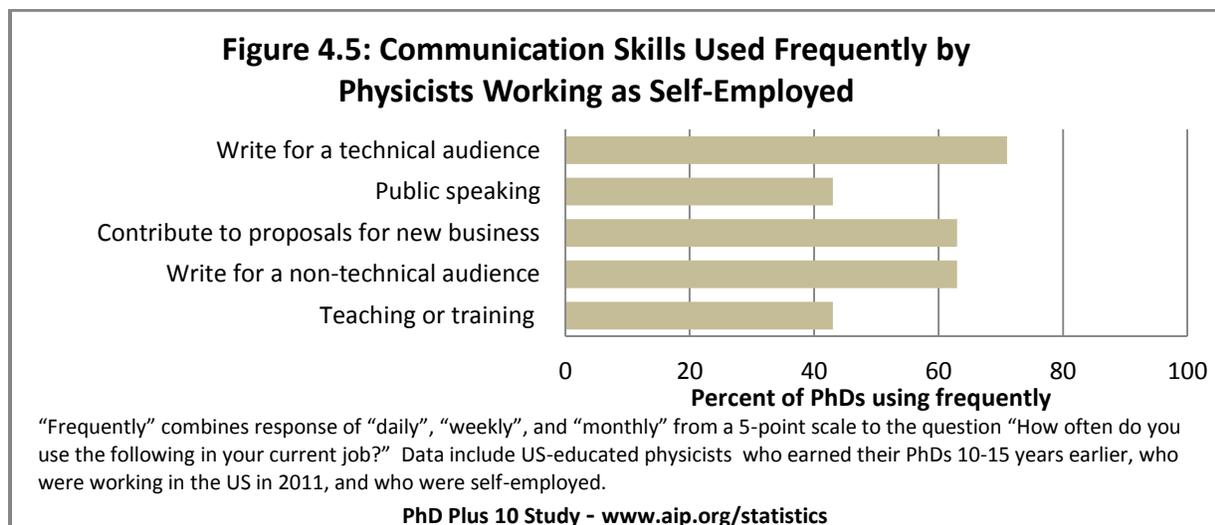
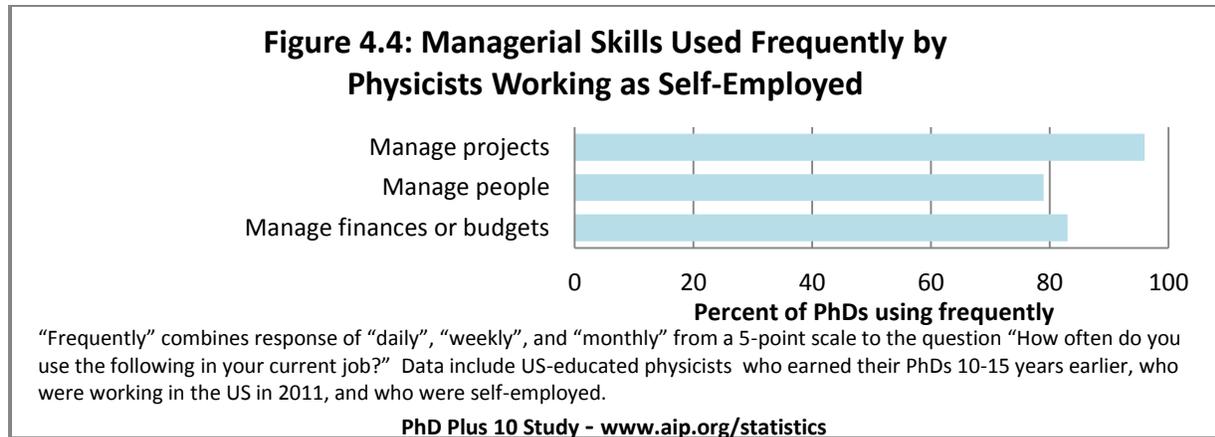


Table 4.2: What Are the Most Rewarding Aspects of Your Job?
Selected verbatim comments from PhD physicists working as self-employed, 2011
<i>[The] satisfaction of creating a viable, sustainable company that can provide a real service to the scientific and engineering community, helping customers... having a work life that supports a balanced personal life... working with optics.</i>
<i>The fact that all my endeavors, whether they are glorious and challenging (solving basic research problems) or small and annoying (paying the phone bill) advance my own cause...</i>
<i>Flexibility to manage my own research interests and my own schedule with young children at home.</i>
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