

Chapter 11 - Industrially Employed Physicists: Primarily in Non-STEM Fields

Employers

This chapter is based on the responses of 32 mid-career physicists who were employed in the private sector and were working primarily in non-STEM fields. These physicists were often in high-level managerial positions and were managing projects and people for corporations, some of which were part of the science and engineering enterprise. Interestingly, of the physicists who were not working in STEM fields, nearly one-third earned additional degrees that facilitated their transition into a non-STEM field. Half of those who earned additional degrees earned Master's in Business Administration (MBA) degrees and the other half earned Juris Doctors (JD) from law schools and became practicing attorneys.

Job titles

Table 11.1 lists common job titles of industrially employed physicists who were working in non-STEM fields 10 to 15 years after earning their PhDs. Most of these titles were consistent with positions in upper management and the legal profession.

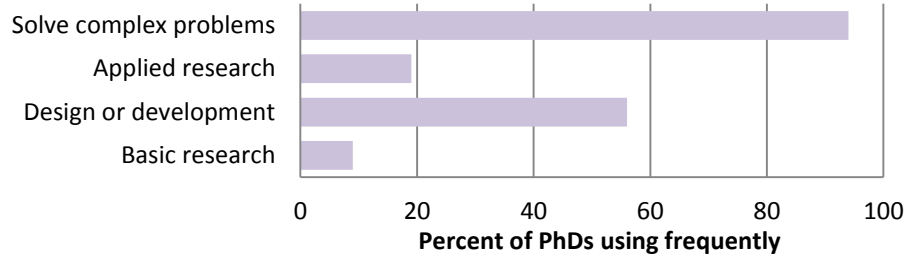
Table 11.1: Common Job Titles of Industrially Employed Physicists in Non-STEM Fields, 2011
Director President; Vice President Attorney Manager
PhD Plus 10 Study - www.aip.org/statistics

Job duties

The mid-career physicists in this group, including those with MBAs, utilized problem solving skills in achieving long-term business objectives, and, to a lesser extent, immediate business needs. Physicists described devising corporate and operations strategy, training employees, analyzing manufacturing processes to maximize efficiency, improving processes and limiting expenses, quality assurance, and directing new initiatives. Some of the work these mid-career physicists did focused on assessing future risk, forecasting potential markets based on trends, and fostering long-term profitability.

Physicists working in non-STEM also oversaw daily business operations, project management, database management and programming, design and manufacturing, and sales and marketing.

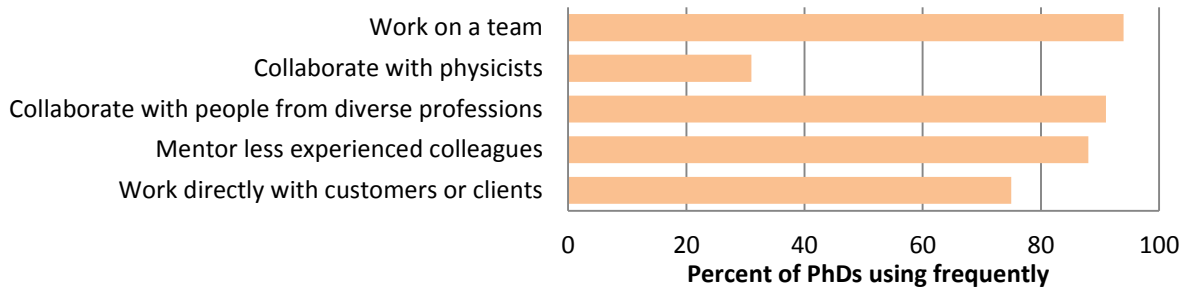
Figure 11.1: Cognitive Skills Used Frequently by Industrially Employed Physicists Working Primarily in Non-STEM Fields



“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 whose primary field of employment was a non-STEM field.

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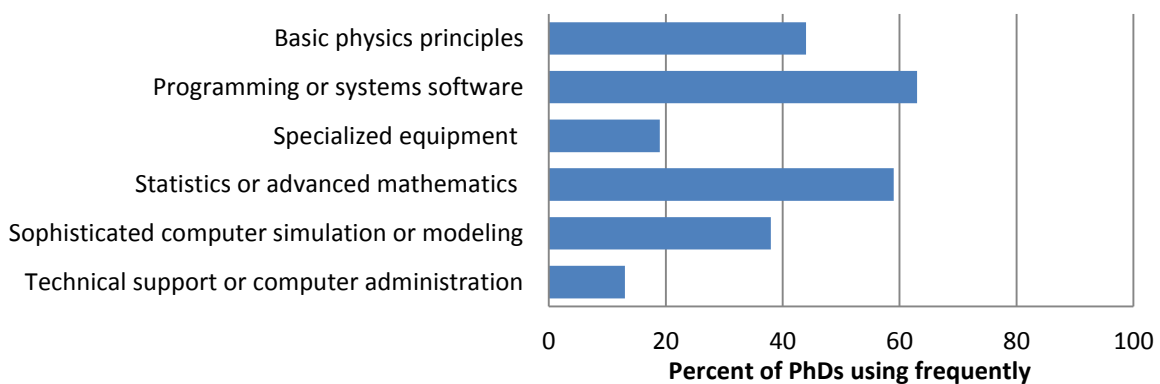
Figure 11.2: Interpersonal Skills Used Frequently by Industrially Employed Physicists Working Primarily in Non-STEM Fields



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Figure 11.3: Scientific and Technical Knowledge Used Frequently by Industrially Employed Physicists Working Primarily in Non-STEM Fields



“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 whose primary field of employment was a non-STEM field.

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(Job duties cont.)

The JDs described working on intellectual property (IP) litigation and prosecution, drafting patent applications, and advising clients about IP strategies, assessing the legal accessibility of incorporating others' patents into new products, and helping clients develop patent portfolios relevant to their business goals. Some physics PhDs who did not earn JDs also worked on intellectual property law in consulting roles for law firms or private practices. IP law, though technically non-STEM, is obviously and inextricably linked to the STEM community.

Mid-career physicists opted out of STEM careers due to factors that push them out of STEM careers as well as factors that attract them to non-STEM fields. Physicists described being concerned about competing for academic positions and being limited by academic bureaucracy, limited funding for physics, and losing interest in a narrow subfield of research as contributing factors to their leaving STEM fields. They also described being attracted to new fields by opportunities for advancement, utilizing a broader range of abilities than would have been required for physics research, and the intellectual excitement of experiencing a new field.

Knowledge and skills used on the job

Mid-career physicists in this type of career frequently solved complex problems (Figure 11.1), many of which involved managing projects (Figure 11.4). Interpersonal skills were essential in this type of career and about 90% of them reported that they worked on a team with professionals from diverse backgrounds (Figure 11.2). Nearly 90% reported that they frequently mentored less experienced colleagues. Use of systems software and advanced math or statistics were important in these lines of work (Figure 11.3). These mid-career physicists reported that communication with non-technical audiences was very important and that they were often involved in training, especially of other employees (Figure 11.5).

Most rewarding aspects of their jobs

Physics PhDs who were working in non-STEM fields 10-15 years after earning their doctorates described what it was about their jobs they found most rewarding.

- The most often cited rewarding aspect of work reported by this group was the intellectual challenge of working on difficult and diverse problems.
- Many physicists in this group enjoyed working with smart people, often from diverse professional backgrounds.
- It was common for mid-career physicists to derive satisfaction from helping their clients and companies succeed.

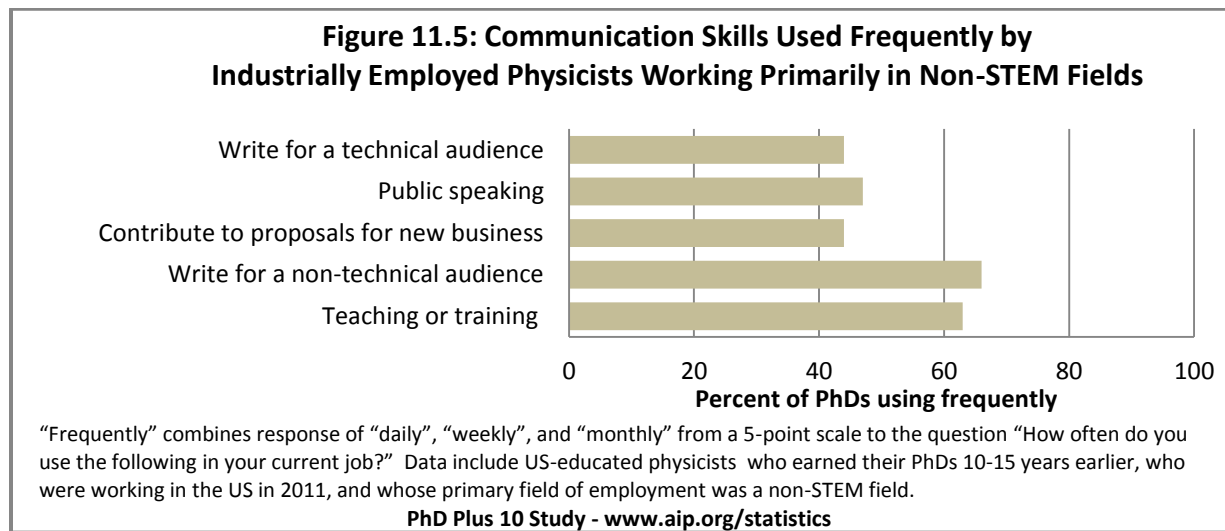
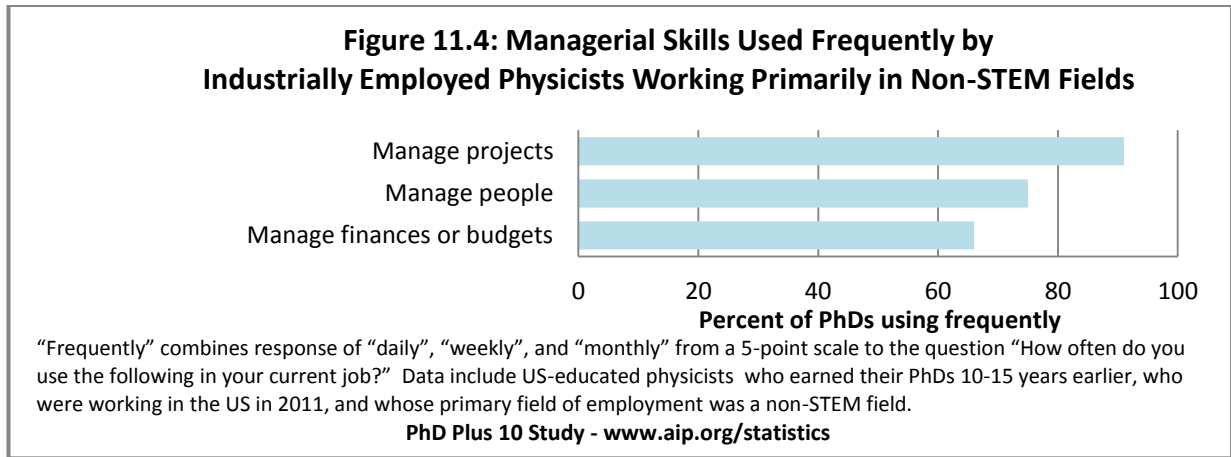


Table 11.2: What Are the Most Rewarding Aspects of Your Job?
Selected verbatim comments from PhD physicists working primarily in non-STEM fields, 2011
<i>Ability to influence a large organization and see the results of one’s work, varied challenging business and organizational problems to resolve, a great management team, a great group to manage, and working with great technical people.</i>
<i>Being able to bring both my problem solving and science skills together with my business skills.</i>
<i>Getting to learn about new technology and solving clients’ problems.</i>
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