Taking the Leap: Moving from Industry to the Academy

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Abstract

Every year, some percentage of practicing engineers examines options to leave their industry role and move into the professorate. The reason for this desire for change varies widely. Whether they are hoping to give back to the profession after a successful career, found that their passion is teaching or building the body of knowledge through research, or hope to find a better lifestyle; educators with a deep set of industry experiences have much to offer their new employers. But they also face a unique set of challenges in adjusting to academic life that other new, more traditional, members of the faculty may not encounter. These challenges include successfully adjusting to the politics and inner workings of the academy, when they may already have a deeply ingrained set of expectations for the workplace; balancing life and work during the challenging start-up and pre-tenure period, when they likely have a greater set of outside commitments than younger new faculty members; and leveraging their skills developed in industry for success in the classroom and research. This article explores the experience of two faculty members who each made the move after over fifteen years in industry, one who is now early in that transition and the second moving toward full retirement. These experiences are used to outline not only ideas on best practices for being successful in the transition, but pitfalls and traps to avoid.

Introduction

The motivation of this article is to explore the transition from industry to teaching from both a specific and general viewpoint. The specific context explores the perspectives on the experiences of two faculty members who each made the move after over fifteen years in industry, one who is now early in that transition and the second moving toward full retirement. These experiences along with a review of literature, both on general career transitions and those into education, are used to outline not only ideas on best practices for being successful in the transition, but pitfalls and traps to be aware of and avoid. The specific goals of the article are to:

1. Provide an overview of the literature on the motivation for career change and explore the current research on the personal reasons for these transitions. In particular, examining specific types of positions and how they fit career changes into engineering education.
2. Explore issues in how industry experience is or is not valued by the academy and the various positions possible in higher education.
3. Identify key considerations for the practicing engineer considering a move into the academy, and
4. Outline how best practices learned in industry apply to each of the tri-partite mission elements of most academic appointments.

Understanding the Motivation for Career Change

It is not clear how often career changes typically occur since records and data related to the frequency of career changes are confounded by the number of job changes. For example, based on statistics from the Department of Labor, it is not possible to precisely identify the number of career changes occurring in the workforce. The data cannot be segmented between switches
from one employer to another (which is sometimes a career change) from a switch from one position to another while working for the same employer (which is probably not a career change but could be). However, the data does indicate the number is substantial considering the average number of job changes (some number of which are career changes) is about ten for workers between the ages of 18 and 38.1

A number of studies have highlighted the factors which influence career changers from non-career changers. One of the more detailed studies found several themes that differentiated these two groups.2 Although both changers and non-changers required careers to provide a sense of identity and satisfaction, non-changers were motivated by more extrinsic career needs compared to changers. For example, changers might describe career needs in terms of words such as excitement and challenge where non-changers would use terms such as security and money. This translates into a perspective where changers see their careers as a vehicle for self-expression and growth and are prepared to take risks to accomplish this. The term “prepared risks” is applied to changers in this literature to refer to the willingness and flexibility required to take advantage of changing circumstances, such as recession or family changes, to make career transitions. On the other hand, non-changers often allowed concerns for security, power, and position to control their choice process at these transition points. Another study echoed these themes and found these factors were related to the three most important career transition success factors for the changers:3

1) displayed greater job and occupational mobility;
2) were more internally motivated;
3) usually moved towards a specific new career instead of away from an existing career.

Other studies examined the cognitive and affective thought processes involved in the planning of voluntary career change.4 A common theme in these studies is the importance of a realistic and accurate understanding of the proposed new career. A particularly useful view of career change proposes grouping these steps into various phases.5,6 The initial phase involves separation from a previous career and the transition stage involves individual identities in flux as changers explore and experiment with different career roles. In the final stage, changers reflect on the value of the transition for their future career, rejoin society and take on their new career role.

There is a substantial body of work on the specifics of transition to an educational career and these studies found similar dimensions appearing in the decision process.7-9 Although primarily reflecting a transition to K-12 teaching, these studies often revealed that career changers’ motivations were largely intrinsic, although pragmatic decisions were also important, with perceived family-friendliness of a teaching career a common response. These results were generally consistent with findings of the general career change literature and research into motivations to teach. An interesting point, even in the K-12 career transition literature, is that many career change entrants believed that the most important attributes they bring to teaching are life experiences, generic workplace skills and experience, and personal qualities, rather than specific content knowledge.10

Generally this literature is consistent with our motivations and experiences related to career change. Table 1 summarizes several of these key points, matching the literature and the experience of the authors.
Table 1: Career Change Factors

<table>
<thead>
<tr>
<th>Career Change Literature Finding</th>
<th>Influence on Career Change of Authors</th>
</tr>
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<tbody>
<tr>
<td>Career Changes Occur Often</td>
<td>P. Kauffmann: Single company for 21 years, positions always engineering oriented, transitioned from engineering design to engineering management after four years.</td>
</tr>
<tr>
<td></td>
<td>W. Schell: Four companies in 15 years, starting in traditional engineering roles and moving into engineering, project, program, and technology management.</td>
</tr>
<tr>
<td>Job and career mobility</td>
<td>PK: Three geographical transfers and ten different job titles</td>
</tr>
<tr>
<td></td>
<td>Author2: Five locations, three with same company, fourteen job titles.</td>
</tr>
<tr>
<td>Internally motivated- context for change</td>
<td>PK: Industry in transition, excitement and opportunities diminishing. Desire to contribute in a more personal way</td>
</tr>
<tr>
<td></td>
<td>WS: Nature of work became less satisfying in large organizations. Sought more intrinsically rewarding opportunities in small company before academics.</td>
</tr>
<tr>
<td>Moved toward new career and specific planning</td>
<td>PK: Began taking more grad courses several years prior to career change. At time of transition, explored purchasing businesses and other corporate career opportunities.</td>
</tr>
<tr>
<td></td>
<td>WS: Academic position was a long held career plan. Completed doctoral work part-time while working full-time to enable this transition at a future date.</td>
</tr>
<tr>
<td>Transition to Academia</td>
<td>PK: Department chair and instructor in a community college while completing terminal degree over five years. Provided opportunity to explore various types of academic positions.</td>
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<td></td>
<td>WS: Left industry role to accommodate family changes and the needs of a dual career household. Immediately accepted part time adjunct teaching role, transitioned to full time with program head responsibilities the next academic year and hired into a tenure track opening the following year.</td>
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As shown in the table, the authors’ experiences reflect many of the motivational themes common in the literature. Differences include the rather unique paths into the academy, notably the leadership roles held early in our academic careers. Additionally, the key difference in experience between the two authors, the more frequent movements by Schell, may be reflective of the larger societal change in job mobility of recent years. How these societal changes might further influence the motivation of career changers is a potential area for additional investigation.

Once motivations are understood, it becomes important to understand the different types of academic positions and how they may or may not integrate with the motivations of a career changing engineer.

Types of Academic Positions
Considering the importance of personal motivation factors and the decision processes noted above, it is critical to understand how motivations fit into the varied roles available within the academy. This section provides an overview of the literature describing the potential options and requirements for engineering related faculty positions. One of the first realizations in searching this literature is that it more frequently examines engineering technology positions rather than engineering. It appears the reason for this is that engineering technology programs have
traditionally focused on graduating a technologist, a more applied career area related to engineering, with minimal design focus. Consequently, faculty with practical career experience were preferred. In fact, up until recently, ETAC accreditation criteria for faculty required industrial experience. The 2013-14 criterion reflects a more flexible statement but still emphasizes appropriate practical expertise:

Each faculty member teaching in the program must have expertise and educational background consistent with the contributions to the program expected from the faculty member.

Several recent papers have provided an overview of career change options into engineering education. One group of papers addresses the issues of tenure track versus non tenure track positions. In general these papers emphasize the key issue of teaching focus (non tenure track) contrasted with job security (tenured positions) and also point out the very structured requirements typically associated with gaining tenure. The distinction on how this difference plays out relative to tenure requirements is described in more detail in several papers which relate the tenure issue to the nature of the university. Based on the interests of the career changer, it is critical to thoroughly examine the various requirements of the possible nature of the institutions and the requirements of the available positions. In addition, academic job seekers are encouraged to look beyond the institution and consider the characteristics of the department, including such things as whether you will be one of many interested in a specific field or the key expert, the social nature of the department, etc. Overall, it is key that a career changer does not simply trade one set of perceived career negatives for another without knowledge of the trade-offs being made.

An interesting theme in this literature involves the perceived “scope creep” in engineering technology programs. Specifically this addresses the issue of the trends in all institutions and degree areas, including engineering technology programs, to increasingly demand publications and some level of funded research, not just teaching excellence, for all tenured and tenure track positions. The important message here is that higher education is continually in a state of transition and this can have a material impact on the long term happiness of the career changer. The university and department selected today can potentially decide to change itself at some point in the future, as it appears many engineering technology programs are currently doing.

One point from our careers which is not discussed in the literature is the constrained geographical nature of career searches in academia. A changer may feel that a teaching institution with a tenure track position is the best fit. However, finding such a position may be challenging especially considering the random and seemingly erratic way academic positions open up. Consequently, factors which must be considered are both timing (is there time to look for the best slot?) and geography (where am I willing to go and what compromises am I willing to make?).

**The Value of Industry Experience**

As noted in the literature and substantiated by the authors’ experiences, the motivation for engineers in industry seeking to move into the academy is often intrinsic. Whether it is the opportunity to mold the excellence of future engineers through teaching, the case for one author,
or contribute to solutions for complex problems through research, the case for the other author, the experienced candidate is often looking for what they perceive to be a more meaningful career. Often these candidates have had substantial experience that they believe will be highly valuable to their new employer. However, as noted in previous discussions, how this experience is valued varies widely.

Value in the Job Search
While some current reports seeking to improve engineering education stress the potential benefit and importance of bringing this ‘real world’ experience into the classroom, they simultaneously note the lack of movement toward this change. In fact, some guidance for those seeking careers in the academy suggest limiting the amount of industry information included in one’s vita because it will not be a key factor in hiring. While that suggestion may seem both dramatic and disheartening to the prospective candidate, there are reasons to suspect it is accurate. As summarized in Figure 1, a comparison of the year-end review processes from the authors’ time in industry and the academy finds very little overlap in what is deemed important by the two employer types.

The minimal overlapping elements illustrates the validity of some concerns presented in the literature regarding the value of industry experience to many in the academy. However, it also illustrates an important consideration for the job seeker - how might they best play to their strengths? For instance, while the ability to develop strategic plans and drive change to execute against those plans is not an experience or skill set valued at many institutions, those trying to develop new programs or revamp existing ones might find it compelling in a candidate. One of the authors used this very approach to identify different options in his search and found several options where his industry experience was highly valued by the potential employer. In addition to the potential benefit in the job search, if the correct targets are selected, there are a variety of ways these experiences should prove valuable once the transition has been made, something...
Loendorf noted when comparing the skills of the successful engineering manager with those of the successful educator.20

Value in Teaching
Despite the fact that industry experience might not be widely valued in the job search process, it is important to recognize that it will be valuable in teaching and is generally highly valued by students.21,22 The academic experiences of both authors support this conclusion. First, students are more engaged when they can see how the abstract material they are learning can be applied in their careers. When instructors can draw from a deep set of experiences to show applications, they are better able to paint the picture that connects these dots. For example, the more experienced of the authors started his academic career teaching fundamental engineering courses where his experience not only allowed students to see the needed real world applications but also provided cover for a new instructor to develop their teaching skills. Both authors have examples of being able to utilize industry examples to draw out deep discussions of key course topics in both undergraduate and graduate level courses. One author has even had the opportunity to utilize original case studies in his senior level project management course. The case was augmented by having the other manager involved in the project join as a guest lecturer following completion of the students’ analysis assignment. These are but a few of the examples that have led both of the authors to be well regarded instructors within their departments and institutions, instructors who consistently receive favorable student feedback regarding their courses.

Of course, the value of experience and ability to share applications directly related to the materials being discussed in class is not all upside. One of the authors has noted several occasions where senior faculty discuss the teaching styles of part time adjuncts within the department as “story time with Instructor X.” While it may be tempting to note that these same faculty members have had little full time employment outside the academy, it is more important to consider that these same faculty will be passing judgment on the new, industry experienced faculty member during the tenure process. Additionally, few practicing engineers have had formal instruction in being an effective teacher and, despite the occasional student request in the other direction, no amount of good stories alone will ensure students effectively learn the course material needed to be successful in their future endeavors.23,24

Value in Research
Unless the experienced candidate spent their industry time in a Research and Development role or working in a laboratory setting, it is difficult to imagine that others will see their experience as valuable for the research component of the typical academic appointment. However, those making the transition should not despair, for there is a great deal of potential value from non-research experience that can be applied to research endeavors. A key area comes from the behavioral characteristics that were highly valued in industry and outlined above in Figure 1. Examples include how the ability to think strategically in industry can provide a solid foundation for the new faculty member to develop a vision for their research program; while the ability to focus on the customer will help them position grant proposals and improve funding chances and the ability to build a team will assist in the execution of the research endeavor; while successfully managing graduate students and other members of the research team. Finally, as most companies move to ever greater levels of project based work,25 the experience of planning
and executing projects in industry presents excellent development for building a successful research program.

Industry experience can also open additional doors to funding possibilities. Industry experienced academicians may find themselves better able to interact with potential industry partners and meet their needs. While this path is aspirational for the author beginning his transition to a role with research expectations, this path proved highly fruitful for the other author. This author was able to take the big picture perspective gained in industry and additional academic training and turn it into a stream of research where, by applying industrial problem solving background, he was able to obtain over $500k in funding within 4 years working with partners such as NASA, the U.S. Navy and various industrial clients in the tidewater region of Virginia. The author found his industry experience enabled a better understanding of the problem, and feasible ways to solve it, than the client in most cases. For example, one stream of research involved aviation safety and the need to improve weather forecasts. The funded research provided the business justification for installing weather sensors on small aircraft landing and taking off from small airports. While the author had little knowledge of aviation safety and air traffic control, he brought the group a unique system level perspective and system based way to make a case for change.

Value in Service
While this last component of most tenurable appointments is not something that will lead a candidate to successfully gain tenure, the demands of service expectations can become a hindrance to being successful in other areas and the overall pursuit of tenure. It is interesting that there is not much in the literature on this area of academic success. Again, the experience of industry can assist the new faculty member in properly allocating their time and managing their commitments. First, several of the behavioral characteristics previously discussed, including communicating effectively, will likely prove to be great time savers. Second, the type of work completed in industry can provide substantial direct experience in the types of work that might be assigned. A prominent example would be serving on selection committees, where the industry experienced faculty member has likely screened, interviewed, and hired more candidates than most departments might work with in a decade or longer. Additionally, it is important that industry experience candidates look for ways to leverage service into the other aspects of their appointment. For example serving on an internal research grant or NSF selection review panel can provide insight into how decisions are made to fund proposals, while serving on a group to solicit industry capstone projects can potentially lead to research activities and future publications. Finally, industry experience proves invaluable when working with employers, advisory boards and potential corporate or private donors. Both authors have had the rewarding experience of becoming point players at their department and college levels for these types of discussions, work that is highly valued and minimally time consuming.

Closing and Parting Advice
For those considering a move from industry to the academy, there are many benefits and the potential for a highly rewarding career. As the literature illustrates and the experience of the authors has reinforced, the most important part of this potential move is understanding ones motivations. Only with that understanding can candidates improve their chances of obtaining a position that will provide the intrinsic rewards being sought. Once into the academy, industry
experienced faculty will likely find that their experience is of greater value in all aspects of their new role than they might have initially considered. While the benefits in the classroom are often assumed, there are benefits to research and service as well. These total benefits represent a value that search committees would be wise to consider when reviewing their applicant pool. Simultaneously, the challenges of teaching can be overlooked and serve as a potentially huge consumer of the time of a new faculty member, causing other critical aspects to be ignored.

However, all of these benefits do not mean the transition will be easy. As he progresses into retirement from this second career, one of the authors has concluded that the academic world is one where there is a lack of willingness to address root cause problems, resources are not redirected as needed, and performance is evaluated to keep everyone happy. So in the job search process, candidates are talking to interviewers who probably don’t think like they do. The bottom line is that an industry experienced candidate is trying to sell accomplishments and skills the selectors don’t understand and therefore cannot value. In the longer term as one progresses in their career, they will need to decide what role they wish to play in changing these aspects, including aspirations for the types of administrative positions that will take one away from the work that likely provided the draw into the academy. This is one of the other issues which comes up as one transitions into academic life- what will satisfy you and what compromises are you willing to make?

References
15. Rose A. Career Options in Engineering Education. ASEE Annual Conference; 2006 June 18-21; Chicago.


20. Loendorf W. Transitioning from Industry to Education: The First Year. American Society of Engineering Education Annual Conference; 2004 June 20-23; Salt Lake City.


22. Massie WW. Bringing Practitioners and Practice into the Curriculum. the American Society for Engineering Education (ASEE) Annual Conference; 2004 June 20-23; Salt Lake City.

23. Falkowski SA. Bringing Members of Industry into the Teaching Profession. ASEE Annual Conference; 2005 June 12-15; Portland, OR.


