FROM THE CLASSROOM TO A CAREER: WHAT YOU'LL NEED TO KNOW FOR A SUCCESSFUL TRANSITION[1]

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Preparing for one's professional career in human factors and ergonomics (HF&E) is both an exciting and anxious event. If deciding what one want to do for the rest of their life isn't enough, one has to also decide where they want to live, how much money they want (or need due to student loans) to make, among other important issues. And all of this is usually taking place during the thesis process! The authors of this paper addressed fifteen questions commonly asked by students and faculty members to help familiarize themselves with transitioning from being a student to being a Human Factors professional in a research, consulting, or development environment.

There are five key questions to think about as one prepares to eventually enter the job market.

1. *When is the right time to prepare for a job search?* In reality, you should always be job searching during your graduate career in that you should strive to meet as many professionals as possible and to learn about where HF&E work is conducted at various companies and agencies around the world. You should also develop a sense of what type of industry you would like to work in, so you can begin to learn about the industry throughout your graduate career. The first formal step in your job search should begin six to twelve months before you are ready to begin work. You should examine the strength of the job market, your resume, other resumes, talk with other students that are currently seeking a job, and consult with your advisor to determine what type of job you want, the type of organization you want to work for, the geographic location where you want to live. People seeking doctoral degrees should give themselves longer to become knowledgeable about the process. Remember, however, the job market is very dynamic, so once you begin to investigate finding a job keep up to date on changes occurring via reading business periodicals and technical journals and attending technical talks and meetings. For example, several years ago there were many jobs available in both research and development. Today research jobs are much more rare than product design and development work.
2. *What are the critical skills I will need?* The skills needed for research, development, and consulting work are quite varied. Perhaps you have heard this so often you do not pay attention, but communication skills are critical for all careers. You must have the skills to clearly express ideas in proposals, negotiating to influence product design, proposals, writing papers for peer-review, and presenting your results to management and at technical conferences. In terms of technical skills, you need to understand Human Factors, the subject matter, research methodology and statistical principles. Likewise, if you are studying a particular area that requires frequent use of equipment, it is very wise to become proficient at operating and programming the equipment. For successful job search, the critical skills are persistence and thoroughness, effective communication, knowledge of the discipline one wants to work in,

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combined with good self-knowledge of short-term job goals and long-range career plans.

3. *What is the appropriate balance of breadth vs. depth of knowledge?* For jobs in product design and development, breadth of skills and the ability to apply skills to new areas are key. Research in particular will require depth in a particular area. However, maintaining some breadth is appealing. In some academic settings, assistant professors are 'asked' to teach classes outside of their sometimes narrow research domain. Thus, a good goal is to have enough depth to conduct independent research in the future, but also enough breadth to keep job opportunities open. One view is that one should first attain sufficient skills breadth and then deepen only selected content areas, emphasizing depth more in one's terminal degree (say, the PhD) and breadth more in one's pre-terminal degree. Members of the panel do not agree on how many Human Factors Courses to take in Graduate School. Tony, for example, says to take as many HF&E courses as possible, and don't be afraid to take related courses in other departments. Ron, on the other hand, believes that one should do as much research as possible, taking courses as time allows. Once you know the specific area you want to eventually work in, then take courses to support that interest. A strong minor in the discipline in which one wants to work may easily make the difference in getting vs not getting job offers. Be careful of constructing too narrow of a focus on a given topic, thereby limiting your skill set. Don't strive to come out of graduate school with lots of declarative knowledge on a given topic. Rather, you should learn how to address a variety of issues from a human factors/ ergonomics point of view.

   - Be creative about other classes that might compliment HF&E courses, and are relevant to your eventual work discipline such as anthropology, graphic design, industrial design, art, and kinesiology.
   - Make sure you have a solid understanding of statistics, experimental design and working knowledge of at least one personal computer statistical software program.
   - Gain as much experience as possible designing, conducting and analyzing studies. This is often the main responsibility of a new hire. More importantly, learn how to design products as this is the most critical skill in many design and development jobs.
   - Get over your fear of speaking and learn how to give an effective presentation. Sharpen your writing skills, and if possible publish your research while in graduate school. At a bare minimum try to publish your masters' thesis and at least one other piece of work.

4. *Should one tailor ones school curriculum to the type of job they want?* For a development job, Ron's answer is unequivocally yes. Having subject matter expertise in a particular discipline may make the difference between getting and not getting a development job. If you are planning a career in research, you should definitely orient your curriculum towards building fundamental research skills such as statistics and technical writing. However, there are many generalizable skills that cut across narrowly-defined content areas; mastery of these is key to flexibility in one's career.

5. *How valuable are internship experiences?* Internships are extremely valuable for all potential hires. Not only do they provide some very helpful resume material and potential examples of your work, but occasionally they lead to a permanent position. For the job candidate, they are the most realistic job preview possible. For the potential employer, they are evidence of directly-related real-world experience. On the other hand, don't feel too tempted to participate in many internships. You also need to develop an in-depth understanding of your research, publish, and possibly a closer relationship with your advisor. Too many internships can also lead a perspective employer to wonder why the potential applicant spent so much time in school.

There are five key questions concerning the job search.

1. *How do you make contact with people?* Conferences, especially 'applied' ones, are an excellent way to meet people and keep abreast of what is happening in the job market. You may meet persons looking to hire in the near future or other students that can share their experiences with you. Also, you should not overlook the faculty in your department. They may have many contacts and may be an important source of help in looking for jobs. Professional organizations (such as HFES), placement services, conferences, networking, professors and alumni

of graduate and undergraduate colleges and universities. volunteering to help at conferences are among the better ways to make contact with people. Keep a log of your personal contacts and a list of organizations that employ HF&F professionals.

2. *What is an interview like?* Logistically, an interview may be over the phone or in person. It may involve a single interviewer or multiple interviewers (concurrently or sequentially). It may involve a formal presentation, informal discussion, and/or a shared meal. It may be less than an hour or all day. It may be strictly within-discipline or involve a variety of technical and non-technical professionals. Each interview is unique. At the doctoral level, interviews can be rather long; in some cases, they may be several days long. You will likely meet numerous individuals from the organization who may ask rather diverse questions. Do not overlook asked the obvious questions (e.g., what are your strengths and weaknesses?). In particular, you should be well prepared to explain how your future plans match the needs of the organization. If you are hoping to join a research organization, you should have thorough understanding of potential funding agencies and journals in which you would like to publish your work. If you are hoping to join a development organization you should understand the product line. Also, you should ask what the organization would like done and explain how your skills are appropriate for the position. In general, remember the purpose of an interview is to determine whether or not you want the job and whether or not the employer wants you. It is ok to tell an employer if there is a mismatch if you notice this during the interview. An interviewer works hard to get a job offer approved. If you turn down the offer after all of that effort, you may reduce your chance of being hired in the future when there is a good match.

3. *What are employers most interested in?* Quite simply, employers are most interested in whether or not you appear to have the skills that will contribute to your ability to successfully perform in the job. Thus, the ability to communicate your qualifications for the specific job is critical. Capable, flexible job candidates with good professional content and process knowledge are most likely to interest employers. Educational credentials (i.e., earned degrees) and relevant work experience are usually assessed in connection with these interests. Perceived fit with potential coworkers and organizational culture is also of interest to employers.

4. *How will first job choice affect career options down the road?* You should not necessarily enter a job with the thinking that you are going to spend the rest of your career at the same institution. The organization may change and/or you may change. If you feel research must be an integral part of your future, then take a job where you will be doing research. It is not uncommon for researchers to teach at local colleges or universities. This option not only broadens your experience, but it may also leave the academic avenue open. If you take an applied job in industry, it may be difficult to get into academia/research. So, if possible, try to foresee where you might want to go in the future and use that as an aid. Also, talk to your advisor or someone who knows what type of backgrounds are best suited to different types of jobs. The first job does signal to future employers what the initial interests of the candidate were at the time of graduation. The length of time that a person stays in the first job also may be assessed to determine whether initial interests changed. Additionally, duration of time on job may be assessed to determine whether or not its worth hiring the person for another job. Generally, the jobs held within the first ten years after graduation may be said to have a greater cumulative affect than the first job choice.

5. *Should a resume be tailored?* Our panel is divided on this issue. Most of us believe that a resume should definitely be tailored. Industry wants to know what experiences and skills you have that can be used to solve problems in the field. Academia/research organizations prefer to see publications and presentations indicative of the ability to conduct independent research in the future and disseminate the results. Dissenting is Georgia Green who believes that the resume itself should not be tailored; this creates a negative impression if a potential employer somehow receives multiple different versions. She believes that it is a good idea to have a resume, a vita, a list of publications and presentations, and a list of references; the candidate can then submit whatever combination of materials seems appropriate to a given job opportunity.

There are five additional key questions dealing with what a person entering the work force for the first time might expect to encounter during the first year or two on the job.

1. *What are typical job responsibilities?* In a research environment resposibilities include generating research ideas consistent with the organizational goals and then conducting the research and publishing the results. In a development environment responsibilites involve developing products that make the company profitable. In both environments working on multi-disciplinary teams that may represent such diverse disciplines as physical therapy, engineering software engineering, epidemiology, and sociology is the norm.

2. *What are the rewards?* The primary reward of research is the discovery of new knowledge, especially if you can see the knowledge applied. After all, isn't that the point of research? In some cases, the rewards are external including factors such as raises, promotions, and peer recognition and awards The opportunity to influence products or processes that affect humans at work is a great reward. Another reward is the beneficial diversity gained from working in a multi-disciplinary professional team, as is more and more typical. The reward of development jobs is seeing your product develop from conception to market.

3. *What are the frustrations?* One of the biggest frustrations of research tends to be things not going as planned. In just about any project, things can go wrong that seriously delay the project. The peer review process can also be frustrating (sometimes it may be just plain anger) -- it's a process that requires patience! Educating other professionals regarding the contributions of human factors may draw time away from its practice. Also, there is usually greater need for human factors within an organization than there are available professionals, so priorities must be set. From a development perspective, projects are cancelled for a variety of reasons so your work may never be used.

4. *What contributes to success?* Success will often come from being motivated internally to succeed. Research requires motivation. There is no more advisor checking deadlines or asking if you've prepared a manuscript for publication. Likewise, the process of conducting research has many inherent lags. If you slack off, its almost impossible to catch up quickly. Clear and effective communication is a critical factor. Written reports, oral presentations, summaries of revicwed literature, and everyday

   - Show your ability to do your job well and to accomplish even more than that which has been assigned to you. In some environments you will need to directly highlight your contributions to your management in other environments it is better to allow your good work to make your employer dependent on you for increasingly important tasks.
   - Learn to work well with others, and not just other HF&E types. Human factors is always part of a larger design or evaluation process and thus the better you are able to integrate your knowledge and methods with other engineers, designers, etc., the better you will be able to influence the final product.
   - Finally, if you are working in industry (and academia for that matter), remember this: Companies exist to make money. Therefore you can't perform HF&E activities within a bubble. In other words, learn how to integrate HF&E with marketing, engineering and sales. Don't just design good interfaces; design good interfaces that sell! interactions with coworkers are all part of communication.

5. *What contributes to failure?*

   Lack of motivation and periods of 'inactivity' are real killers. Unrealistic expectations of one's first job may lead one to fail by diverting focus from key job tasks (i.e., doing what one "ought" rather than what one "must"). Devoting insufficient time and effort to the job search process may also lead one to accept a poor fitting job and lead to eventual failure. Similarly, a lack of flexibility to change assignments, poor communication and leadership skills, and missed deadlines can easily lead to failure.

REFERENCES

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