# HUMAN FACTORS CAREER ISSUES AND ANSWERS:
## CHOOSING AND PREPARING FOR A CAREER THAT WORKS FOR YOU

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Welcome to the eighth annual Human Factors and Ergonomics Society Career Panel. The questions answered by this panel address many of the issues that graduate students and recent graduates have about entering the Human Factors field. The goal of this panel is to help individuals interested in becoming Human Factors professionals prepare for their career. This year, the panel answered eight questions addressing issues in four different areas: (1) the academic experience, (2) skills/knowledge, (3) demonstrating competency, and (4) job matching. During the HFES meeting panel session, the panel will focus on questions from the audience.

## THE ACADEMIC EXPERIENCE

**What aspects of your academic experience made the most difference in what you do today?**

*Jennifer.* My academic (statistical and research skills, background in cognitive psychology) and applied (internships during my academic career) experiences have made the most difference in what I do today. My academic experiences have given me the confidence and ability to make critical decisions about design, usability testing, and statistical analyses as well as giving me the data to back up my decisions.

*Steve.* Although much of the academic experience is centered around learning specific facts and figures, I feel that the best returns came from my experiences working with other people, and applying knowledge to problems. I did not participate in an internship or co-op when I was a student (a decision I somewhat regret), but the experiences I had working with other people on class and other projects proved helpful in making the transition from academia to industry. So much of what people do in industry is based on working with teams to achieve a common goal, and teamwork experiences in school help one build the skills needed after graduation. In addition, the experiences I had applying knowledge to both theoretical and real-world problems provided me with the skills necessary to help bridge the gap between "ivory-tower" theory and "in-the-trenches" practice.

*Jean.* The most influential academic experiences for me were the design projects I worked on as an undergraduate. I was in the Tufts Human Factors program, which has a heavy emphasis on product design. Our projects covered all phases of development, from proposal writing and literature and product reviews to prototype development and user testing. These projects gave me experience in a variety of usability methods, which I found I really enjoyed. I learned other things from the projects as well. We had to present the results of our projects, so I learned to give presentations without panicking. Many were group projects, so I had to learn to work with others. I found that some people are more reliable than others,

and I learned to live with that. Most importantly, I learned that I love working on design teams, which is what I'm still doing today.

*Arnie.* My job involves understanding user needs and designing interfaces for new technologies and applications while simultaneously managing people. While for most of my career I have worn the title Human Factors professional, I currently am called an information architect. There were several skills that have proven useful in this and previous jobs. First, I learned how to learn. I learned how to develop expertise in a new area quickly. Second, I learned how to tackle an ambiguous problem and to identify the steps needed to resolve it. Third, I learned how to solve the immediate problem while learning something that helps me solve related problems quickly. Fourth, I learned curiosity and the ability to find something interesting inside areas that, on first glance, seem less than interesting.

*Tony.* While the courses I took gave me a great foundation of knowledge, my personal interactions with the students and faculty at my university, as well as other professionals I met at various Human Factors conferences, have had the greatest impact on my career. In my opinion, you learn the most from other people -- what to do, what not to do, what to expect, what to believe.

**What qualities should I look for in a graduate program to help my career?**

*Jennifer.* You want a program that will give you a good foundation in research and statistics. If you are interested in a particular area of human factors (e.g., human-computer interaction or industrial design), you want a program that can offer a concentration/minor in that area. If you are not sure what you want to do within the realm of human factors, you would want to go to a program that still gives you the solid research and statistics background, but has a more general focus. The best part about graduate school is taking the time to gain experience in different areas of your discipline. These

experiences can come from research, coursework, internships, and/or independent studies.

*Steve.* I would look for practical experience and exposure to outside problems. Learning the theory is important, but it can be without meaning unless you actually go through the process of applying theory to real problems. I would look for research opportunities that are applicable to (or directly associated with) industry and governmental agencies that are looking for solutions. In addition, look for experiences you have a passion for. Unless you are driven to "dig deep" to truly understand the problems and look for real solutions, the work may not have a lot of meaning for you, and you might find yourself feeling burned out before you are finished with the program.

*Jean.* There are a lot of factors to evaluate when considering graduate school. First, consider your areas of interest. Some programs are well known for specific areas of study (e.g., biomechanics or product design), so you might find a school where the whole program focuses on your area of interest. If there is no good match, you should look for a school where one or more professors are pursuing work that interests you. You should review their publications to see exactly what kind of work they are doing. You should also find out if there are positions and funding for the projects you want to work on. If you're not sure what you want to do, a larger program might be better, because it will have more professors, and, therefore, a wider variety of specialties. You should also consider characteristics of the program. For example, at a smaller program, you might get more individualized attention, but at a larger program, you might meet more people. Also, some programs are geared toward full-time students, while others are geared toward part-time students. A program for full-time students will offer classes during the day, which may be a problem for part-time students. On the other hand, in a part-time program, there may not be much social interaction among the students, as they may be busy with their work and families, in addition to school. Therefore, you should look for a program that matches your situation. Finally, I would talk to current and former students from the program. They can describe their experiences and provide their own insights on life in their program. Often, the students' perspectives are different from the professors'.

*Arnie.* I would always look for an opportunity to personally learn from the best, and to work with talented people on interesting projects. Interestingly, these are the same criteria I use in looking for a job. I would look for training in a relatively broad range of skills, but also for expertise and experience in areas that may be of interest to industries in which I am interested. I would look for the opportunity to conduct individual research, as well as research on teams. While I think some of these other considerations are more important, it could be helpful to be in a lab pursuing applied research. Finally, I would look for a program that supports pursuing internships.

*Tony.* There are several dimensions to consider. First, does the program offer courses and/or research experiences in the topics that I am interested in? Second, do the faculty have strong ties to the "real world" and create an environment where students can work on real products and systems and interact with designers and/or users of commercial products, systems, or work environments? Third, since it's common for students to end up living and working in the area they attended their graduate program, it may be important to select a program located in an area where Human Factors professionals can easily find employment. Finally, look for a program in which your association with the faculty members or the institution itself gains you credibility and respect in the job market.

*Ron.* In addition to everything else mentioned, decide if you like, and can work well with, the faculty and students. You will be working with them very intensively for four to six years. You'll enjoy graduate school a lot more if you enjoy interacting with the people you'll be with most waking hours.

## SKILLS/KNOWLEDGE

**What technical skills should I develop in order to improve my chances of getting a job?**

*Jennifer.* If you are interested in usability/interaction design, the ability to develop high-fidelity prototypes using tools such as Photoshop or HTML is invaluable. The ability to review, evaluate, and document something quickly and concisely is an important skill. You also need to learn new skills even after you have your job. Continuing education is very important to keep you up to date with new technologies and techniques.

*Steve.* When we interview candidates and find people who satisfy the basic skills needs, we often scrutinize candidates' people skills and independence. If we find someone who has demonstrated the motivational skills to drive a project independently (perhaps they opened a business or built an airplane in their spare time), that person may be a great asset for the team. However, we also look for people who have demonstrated expertise in at least one critical skill area, such as programming, design, or research. I'd recommend becoming well skilled in at least one job-related skill area, using some kind of tool (such as Visual Basic or Photoshop), to demonstrate that you have the drive to learn a skill to proficiency. In addition, it also demonstrates that you have an understanding of a key factor in product design--redesigning takes time. In a world driven by development cycles and time-to-market pressures, it's important to be sensitive to the fact that every time a project is delayed (for research purposes or because code has to be rewritten), there are multiple costs associated with the delay. If you have experience developing your own products (programs, processes, designs, etc.), then you're likely to have a better understanding of how making changes late can come at a high cost.

*Jean.* Human Factors specialists often serve as translators between users and developers. Therefore, we have to be able to understand both populations. Since you probably don't know what user populations you'll be working with, you should gain experience with usability methods, which help you learn about users and their tasks. There are many usability techniques, most of which are not taught in school. Sometimes you can learn the techniques on your own and apply them in a

class or independent study. Another good way to become experienced with them is through a co-op or internship. Potential employers prefer candidates who are familiar and experienced with usability methods. It's also important to understand developers. Toward that end, you should know how to program. Programming skills allow you to talk more intelligently with programmers. They will respect your work more if you can respect theirs. Also, if you can program in Visual Basic, C++, or build web pages, you will be able to build your own prototypes without relying on programmers. Knowing how to program makes you a much stronger candidate.

*Arnie.* For the telecommunications and IT areas, comfort with a variety of technologies (e.g., the PC and Web design) is important. We look for user research skills (statistics and experimental psychology). We want to see examples of design (and we talk about the process the individual uses in coming up with a design). A general understanding of perception, cognition, and social psychology as well as their implications for design provide an important base on which to build.

*Tony.* Being able to illustrate and prototype your design concepts can greatly improve your chances of getting a job. Providing some sort of visual or tactile demonstration of your skills is a big plus. However, becoming proficient as a software developer is not always necessary or desirable. While many companies look for a person who can both design and code a user interface, it is not necessarily in your best interest to cross over into a completely different field just to appear more marketable. Keep in mind that if they know you can write code, that's what you'll end up doing!

**What should I do to improve my interviewing experiences?**

*Jennifer.* Before your interview, make sure to research the company and, if possible, the specific department. You should enter the interview with a thorough understanding of the company and how your skills would be an added benefit to the company. Be ready to answer applied questions in your field. Companies are very interested in how you think on your feet and how you can apply the knowledge that you have to specific, real-life situations.

*Jean.* There are several things you can do to prepare for an interview. Most importantly, read about the company beforehand, so you can talk about it intelligently and appear interested. Also, plan to discuss your experiences and talents and how they will be useful to your potential employer. Read books on interviewing; some of them have helpful advice. They list the types of questions you should be prepared to answer. Although you may never get some of the questions, they will help you organize your thoughts. The books also describe "social protocol" for interviews, so you'll know what to expect and what to do. Finally, prepare a list of questions you want to ask. You should ask questions to everyone you interview with, even if you think you have already heard the answers. In summary, you have to be prepared for each interview. It takes a little work ahead of time, but it will make your interview go much better.

*Arnie.* Interview and learn from the interviewing in order to improve your interviewing skills. You can practice with a

friend. You can also use your experience seeking internships to practice interviewing. In this case, you might talk to people, whether or not you get the job, and try to get feedback on what you did well and on the skills you need to improve. Each interview should be a learning experience to help you interview more effectively in the future.

*Tony.* First, bring something tangible (usability evaluation report, before/after interface concepts, etc.) that demonstrates your ability to work as a Human Factors professional. Second, focus on what you can do for this company in the future, rather than focusing so much on what you did or learned in the past. Explain how your presence will benefit the company and ultimately improve their quality of work and financial success.

*Ron.* Practice. Practice. Practice. Practice interviews with all types of people including: potential colleagues in human factors, potential colleagues in technical professions such as engineering and software, potential colleagues in marketing, potential customers, and potential managers. Whenever someone explains a process or project they are working on to you, be prepared to answer the question, "What should I do next?" or "What would you do next?" If he or she doesn't ask the question, incorporate your answer into subsequent discussion. Always ask lots of questions to increase your understanding and to demonstrate your interest.

## DEMONSTRATING COMPETENCY

**How important are publications, presentations, and posters both for getting a job and furthering my career?**

*Jennifer.* If you are looking for an academic or research-based position then they are very important and, to a certain degree, required. If you are looking for an industry/applied position, they are important but they are not necessary for a position. Many academic positions (particularly those at graduate research institutes) require that you publish and bring in research money. Industry employers find it valuable that you have published, because it shows that you have good communication skills, are knowledgeable in a specific area, and that you are a hard worker.

*Steve.* Having publications, presentations, and posters demonstrates that you have experience and expertise in an area, and when you have presented to groups, it vouches for your ability to handle yourself in front of (potentially critical) audiences. I like to see that people have at least one or two publications/presentations/posters on their resume, but I get concerned when I see lots of papers that all deal with the same type of topic. Of course, this depends on the type of job you're trying to get, but in industry, too much specialization in a tiny topic area might indicate that you may be too focused on one issue to be willing to see the larger picture.

*Jean.* Publications are very important for furthering your career for several reasons. First, you make others in the field aware of the work you are doing. This helps to establish yourself as an expert (or at least as being knowledgeable) in a particular area. It also helps you to network with other people who are doing similar work, as they may contact you after you present or publish your work. Further, your publications will advance the field by sharing your work with others.

*Arnie.* My sense is that this varies from interviewer to interviewer and job to job. Personally, I look at presentations and publications as evidence that the person "goes beyond" what is expected, is able to look at the big issues that transcend the immediate problems with which they are faced, and are able to think critically and communicate effectively. The number is not as important as the content and the quality.

*Tony.* They are very important for both superficial and practical reasons. Of the three activities, I would place the greatest emphasis on presentations, because they provide three important benefits towards furthering your career: (1) they allow you to sharpen your oral communication skills, (2) they provide great exposure to HF professionals and prospective employers, and (3) they prepare you for the experiences of professional travel.

**If I don't have any job/internship experience, what can I focus on in my resume/interview to demonstrate that I have skills relevant to the workplace?**

*Jennifer.* You want to focus on different ways that you have applied the knowledge you gained in school to real-life problems or situations. The two main goals of an internship are to give the intern: (1) general knowledge on what it is like to work in a non-academic environment and (2) to teach you how to apply your academic knowledge to the real world.

*Steve.* That's the situation I was in when I first interviewed for jobs. I found that focusing on my class projects, my thesis work, and my independent studies helped to address issues of concern for the people conducting the interview. In school, most students have to deal with teamwork issues, meeting deadlines, and applying creative solutions to complex problems. Focusing on these experiences helps people see that you have the skills necessary to be effective in the work force.

*Jean.* I would focus on the skills you have that would be valued by an employer. Most likely, you will be working on a project of some sort, so any classroom experience on projects would be particularly useful. You could also focus on papers or presentations you have made. Employers are looking for people who can be leaders, so you should mention any leadership experience you have (e.g., in a student chapter of HFES). Finally, be sure to mention any courses you have taken that are particularly relevant to the job for which you are applying.

*Arnie.* If you don't have job/internship experience, you need to try to find elements of such an experience in the work you have done and highlight those. In many graduate student programs, for example, there is an opportunity to work on teams. Highlight that fact when it occurs, and your role on the team as well as your impact on the project. Still, just like volunteering as an undergraduate to help with a professor's research in order to get experience, if you can't get hired as an intern, volunteering as an intern can sometimes get you valuable experience. This could be particularly important in today's market where many experienced people are also looking for jobs.

*Tony.* Focus on your ability to make a difference in the context of this particular workplace. On your resume highlight your relevant skills ahead of your job experience. During the interview, give an example of how you would contribute to a typical project performed by this company.

## JOB MATCHING

**What are the key factors to consider in choosing one company over another for a similar position?**

*Jennifer.* You want to make sure that the company's work ethic and style are consistent with your personal work ethic and work style. If you do not feel like you fit in with a particular group of people, your work will suffer and ultimately you will end up leaving the company. Before you actually begin your job hunt you want to think about what the perfect job for you would be like. Some of the factors that you would consider are: (a) hours (e.g., the number of hours you believe are desirable to work per day or per week as well as any desire for flex-time), (b) the type of job you'll be doing (e.g., consider the day-to-day activities such as whether it's a consulting position, if it will require travel, and aspects of living in that area), (c) salary and benefits, (d) expected duration of time with the company, and (e) opportunities for promotion.

*Steve.* Deciding which job to take is a complicated decision, but treating the interview as a "two-way" situation will help you make a more educated decision. Spend time assessing whether the people you are talking with are people you would enjoy spending 40+ hours a week with. Ask the interview team who you would most likely spend much of your time working with on the team. In addition, ask about the things that are important to you, such as how the group and management feel about conference attendance, publishing papers, or telecommuting. Ask about how employees are evaluated and how raises or bonuses are awarded. Asking about these issues demonstrates that you are truly interested in the job, and are willing to explore the multiple dimensions involved in taking a role with a company and a work team.

*Jean.* I would consider the following key factors: (a) the work itself—this is the most important consideration (e.g., if it's the type of work you will enjoy, the type of work you want to do, work that will be rewarding), (b) pay and other benefits (consider whether they are acceptable to you), (c) opportunities for advancement (more important for a job you want to stay at for more than a couple of years), (d) opportunities to publish or participate in professional organizations (these activities will help your career but may not be possible in all jobs), (e) location, (f) work environment (e.g., hours of work required, stress level, tightness of deadlines, management style/support, your colleagues) and (g) your gut instinct (identify which opportunity feels right to you).

*Arnie.* For me, if the job title and role are similar, then the next most important criteria are the people I will be working with, where user-interface work fits within the corporate culture, and the general working conditions. I also try to assess the state of the business to determine stability. Additionally, I am interested in the work climate. Finally, I look for opportunities to grow and I try to understand alternative career paths. My goal is to have a job where I look forward to

coming to work each day, and that increases my opportunities in the future.

*Tony.* Beyond the obvious factors of salary, benefits, and location, you should focus on the cultural and political climate in which the Human Factors group resides. Get answers to important questions such as: (1) Is the Human Factors group involved early in the design process?, (2) Are the recommendations of the design group taken seriously?, and (3) Does the Human Factors group have the right personnel and appropriate amount of resources to fulfill their responsibilities? Finally, remember that in the end, it all boils down to the people. You have to be comfortable with, and enjoy the company of the people you end up working with. Choose the job that you will be most eager to go to on a daily basis.

## Who am I competing with for jobs?

*Jennifer.* The type of individuals you will be competing against is, in part, dependent upon the job. If you are applying to a more established company your educational background may carry more weight than experience. The opposite is often true about younger companies. These companies may place a greater value on experience than education. The range of individuals that you could be competing with is larger than in the past. Your potential competitors could include: psychology majors (primarily human factors, experimental, cognitive, or industrial/organizational), graphical and visual designers, and software developers who have interface design skills. The bottom line is that you need to research the position and the company and then sell yourself for that position based on your skill set.

*Steve.* I would have answered this question differently last year, but the competitive landscape in high-tech has changed considerably. You are still competing with recent college graduates who have limited experience in the field, but there are now a substantial number of senior-level people who have been let go from other companies, along with internal employees who are transitioning to a human factors role for the first time. Some of these folks have human factors backgrounds, but a growing percentage are coming from other disciplines, such as marketing and development (programming). Those who lack direct training and experience with human factors methods often carry with them a solid understanding of the product development lifecycle and the problems associated with legacy architecture and a demanding customer base. To differentiate yourself from such applicants, you need to demonstrate how your academic experiences demonstrate that you have the ability to perform in a milestone-driven environment. Capitalize on your ability to work with teams, and talk about how you would apply the techniques and methods you've studied to products driven by dates instead of data.

*Jean.* Competition for human factors jobs comes from a wide variety of fields. Competitors can have backgrounds ranging from traditional human factors to other areas of psychology (e.g., applied experimental, social, or industrial/organizational), computer science, engineering, technical writing, and even fields like marketing and industrial

design. Organizations have their own preferences for candidate qualifications. For example, my group at BLS hires primarily those with psychology backgrounds. You should find out the preferences of potential employers and show them how you meet their needs. It's especially helpful if you have relevant job experience. Organizations don't have much time to provide on-the-job training, so having relevant work experience gives you a significant advantage.

*Arnie.* This question is an interesting one. I have been a Human Factors person for many years, although there has been a debate within HFES and within the BCPE certification body about whether Ergonomist should be the right title. When I joined Sapient, my current company, I could have become an Experience Modeler, but I ended up an Information Architect. I am soon to become either an Information Designer or an Experience Designer. I am sometimes referred to as a Usability Researcher. On the one hand, these and related job classifications are jobs that I am qualified for. On the other hand, people who have been in these jobs are also competing for jobs classified as human factors jobs. Along with the traditional sources of people entering the field out of the behavioral sciences, I have known people entering interface design from engineering (where they were working on user interface design), training and technical writing (where they learned about the importance of designing well before documenting), graphic design and related fields, communications sciences, library science, architecture, and other fields. Each brings a unique perspective to designing with the user in mind, and when they have demonstrated their skills with a portfolio of effective designs they can be formidable competition in the market.

*Tony.* In the Human Factors/Usability field, you will often compete with marketing, technical writing, and software development professionals. In the Ergonomics field, you will compete with Occupational Therapists (OT) and Physical Therapists (PT), as well as safety professionals. Keep in mind that while these are related fields, you have DIRECT education (and possibly experience) in Human Factors or Ergonomics. After all, if these fields were synonymous with Human Factors/Ergonomics why would they exist as separate professions? Lots of people have an interest and desire to work in our field--that's flattering for sure. But, a passing interest or change-of-career urge does not equate with what you have to offer as an educated and trained professional in the Human Factors/Ergonomics field!

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