



Preliminary Report of New Professional Interviews

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From August 2014 to December 2015, 23 information technology (IT) graduates from Florida State University (FSU), Chipola College, and Tallahassee Community College (TCC) participated in semi-structured interviews about their IT education and transition from being IT students to IT professionals. The study team conducted these interviews as part of our National Science Foundation (NSF) Advanced Technological Education (ATE) project *Assessing Information Technology Educational Pathways that Promote Deployment and Use of Rural Broadband*.¹

In the context of this report, we use the term “new professional” to describe former undergraduate IT students who have graduated within the past three years from FSU, Chipola College, or TCC and who have been employed at some point since graduation. This phase of the research was guided by two of the project’s previously stated research questions:

RQ 2: How do the IT/broadband skill graduates gain through two-year community college compare to the skill sets new professionals identify they need after they are hired as IT employees in nonmetro/metropolitan areas?

RQ 3: What, if any, gaps exist between the skill nonmetro/metropolitan employers report their IT/broadband employees need and the skill sets new professionals report they need to be successful as IT/broadband employees?

¹ More information can be found at: <http://www.ii.fsu.edu/Research/Projects/Assessing-Information-Technology-Educational-Pathways-that-Promote-Deployment-and-Use-of-Rural-Broadband-NSF>

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This report addresses parts of the above research questions as they relate the perceptions of new professionals and the skills they use in their early careers.

Method

The goals of this research effort were to characterize the skill sets IT employees need on the job and to identify any gaps between their skill sets and the employers' staffing needs (final report forthcoming). The research team obtained contact information for recent FSU IT graduates from FSU administrators; collaborators from TCC and Chipola College provided the research team with lists of recent graduates' contact information. The research team contacted potential participants and once their willingness was assured, obtained consent, and scheduled phone interviews.

Despite having a list of former IT students, contacting these individuals after they graduated proved to be difficult because they did not respond to their school email accounts. The research team primarily relied on phone calls to establish contact. However, many of the recent IT graduates did not answer the phone calls or return the voicemail messages.

Each phone interview lasted approximately 30 minutes. The initial questions used for the new professional interviews, featured in Appendix A – Interview Protocol, were derived and refined from the interview protocol used for the focus groups with current IT students (reported elsewhere). The interviews were semi-structured and informal, so that related topics could be brought into the conversation. Once the interviews were completed, two members of the research team transcribed and analyzed the recordings and organized the responses by common themes.

The data collected from these interviews have limitations and are not intended to be generalizable. Rather, they are meant to be indicative of experiences of this group of former IT students.

Results

The findings from the interviews will be discussed in the following sections. First, basic demographic information of the participants will be reported. The remainder of the results section will describe their job search processes, most used skills, as well as their perceptions of their education's value and of the differences between working in IT in rural and non-rural settings.

Demographics

Table 1 depicts the number and gender of participants for each school. As the gender gap in the IT workforce in particular, and STEM overall, is well-known, it is important to collect and report gender data for those working in the field to track any potential progress in closing that gap (Quesenberry & Trauth, 2012).

Table 1. Number and gender of participants from each school

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School	Men	Women	Interviews per school
Florida State University	6	5	11
Chipola College	5	1	6
Tallahassee Community College	3	3	6
Totals	14	9	23

As Table 1 shows, the researchers engaged N=23 participants, 14 men and nine women. Most participants (n=11; 6 men, 5 women) were from FSU, while Chipola College and TCC participants numbered six each. Five men and one woman were from Chipola College and TCC participants were evenly split with three participants of each gender.

Some (n=6) of the new professionals mentioned having at least some IT education in high school. Many (n=8) of participants entered into their post-secondary IT programs after having been in the workforce in another field; most new professionals chose IT because of a “love for computers.” Two new professionals who switched from different professions also mentioned the desire to attain higher salaries as a deciding factor for going into IT.

Job Search Process

Finding a job after completing one’s education can be difficult. As our interviewees are new professionals in the IT field, we asked our interviewees to reflect on their own job search processes to describe they found success or did not. The findings reported below suggest that lack of work experience is not necessarily a barrier to getting that first job and that online sources and networking are especially helpful in finding a job.

Experience

One new professional expressed frustration with many of the job ads available for IT positions because “pretty much everywhere I’ve searched has required experience which I don’t have, of course.” None of the other new professionals mentioned lack of experience as a barrier in their job search activities.

Online Sources and Networking

Almost all of the new professionals used online resources for some part of their job searches. The most common resources were Florida’s PeopleFirst², EmployFlorida.com³, Indeed.com⁴, and Monster.com⁵.

Some (n=6) interviewees had not relied on Internet searches due to personal connections and other networking which led to their employment. One former student attended a TalTech⁶ event, spoke with programmers who worked at a local company, and through this connection was offered a job. This new professional mentioned that TalTech is “Such a wonderful networking

² <https://peoplefirst.myflorida.com/>

³ <https://www.employflorida.com/>

⁴ www.indeed.com

⁵ www.monster.com

⁶ <http://www.taltech.org/>; TalTech is an alliance of businesses and schools interested in promoting technology-based jobs and entrepreneurship in the Tallahassee area.

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opportunity for students. I met so many people there, and it turned out to be the beginning of my future career.”

Another new professional attended job fairs like TalTech, but participating in those events did not lead to a job. Other interview participants (n=4) referenced networking with class guest speakers, former classmates, and instructors as helpful strategies for finding a job. For three of the new professionals, their internship experiences also created networking contacts that led to a job.

Skills Used Most on the Job by New Professionals

Soft Skills

Researchers have reported that IT students being educated for the workforce need more exposure to non-technical (or “soft”) skills like interpersonal communication and industry understanding (Lee et al., 2002). Similarly, the new professional interviewees overwhelmingly mentioned soft skills, rather than technical ones, as the most important skills needed on the job. As one participant described, “I would say communication is definitely the key especially if you're working some kind of user support or you have to deal with customers a lot.” Communication falls into the broader category the interpersonal skills that many new professionals mentioned as essential to their jobs.

Interview participants reported that both oral and written communication were important. Many interviewees (n=8) mentioned their honing of these skills in a business communications course, although a few (n=4) new professionals stated that they did not believe that their education adequately addressed the kinds of communication or interpersonal skills that are necessary for their jobs.

“Self-management” was another frequently mentioned skill. Self-management includes setting and achieving goals, multi-tasking, working without supervision, completing assignments on time, and “demonstrat[ing] responsible behavior” (Office of Personnel Management, 2011, n.p.). The new professional interviewees also perceived teamwork, leadership, critical thinking, and work ethic to be important soft skills.

Technical Skills

Two of the most important technical skills mentioned by new professionals were problem solving and troubleshooting – with troubleshooting being more practical “hands-on” ability to fix specific technical issues. Interview participants (n=10) also reported applying basic computer knowledge as an important skill, as without this technical knowledge, problem-solving and troubleshooting would be more difficult. While described as “basic” computer knowledge, this includes specialized knowledge and understanding of how to operate and fix computer hardware and software, such as repairing computers, managing databases and networks, using Windows operating systems, email applications, and Microsoft Office functions. Other new professionals could not narrow down the most important technical skills they learned because they believed everything they learned was important.

Education as Preparation for the Workforce

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The new professionals had mixed feelings about how well their IT education prepared them for their current jobs. While most of our interviewees still work in the IT field, two of the new professionals are working in different fields, one continued on to graduate school in a related, but different field, and one had not found a job yet. As a result, these participants reported that they could not comment on how well their education prepared them for an IT job.

Three of the currently employed new professionals felt that their IT education prepared them very well for their current or future IT jobs. Sample quotes include:

- “Every class that I took here, it gave me something you know, it gave me something whether it was replacing a motherboard or learning the networking side, security side, what to be aware of in the security side.”
- “They covered pretty much everything that I've been using so far.”
- “It introduced me to everything I needed to know, so I didn't walk in on the first day and say ‘What is that?’ ‘What is that?’”

Three former students (n=3) perceived that their education provided everything they could need in their jobs.

Other new professionals felt positively about their education but recognized that formal educational experiences (like degree programs) could only teach so much for the IT field:

- “School introduces you to everything, so you've heard of it, you know what it is. But there's absolutely no way they could prepare you for every scenario”
- “With IT, there's only so much you can learn in school.”
- “There's always going to be a disconnect between the real world and what we're learning in class until you get out there in the real world. The biggest thing is the hands on stuff that the classes don't always have the time to provide you.”
- “There wasn't a whole lot of hands on stuff in the IT program which is I guess one thing they could work on.”

As seen above, students strongly believed that hands on experience and internships are important components of the preparation.

Work Studies and Internships

Most interviewees (n=15) strongly believed that hands-on experience and internships are important components of preparation for the workforce. Internships allowed some of the new professional interviewees to gain crucial skills they use in their current jobs. For others, it allowed them to get an insight into the working world:

- “Work studies and internships are major for making you understand the soft skills and especially technical skills you need to understand, facilitate, and elaborate, and instruct people on how to use it.”
- “I also think internships are important. The hands on experience gives you a real understanding of what you're about to get yourself into and whether it's the right career path for you or not.”

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- “I would say that the internships actually did me more good than the coursework did, to be honest, because it was real world stuff and it was things that I can refer back to and say, ‘I’ve done this before, I’ve seen this before.’”
- “Having that internship experience while I was in college really set me up well for having some expectations with regard to the IT world.”

As seen above, experiential learning opportunities, such as internships, were perceived as very valuable.

Differences between Programs

One new professional took an intermediate level course at FSU and then the same course again at one of the other IT programs a few years later to refresh his skills. This new professional found that the course was much simpler in the second program: “As far as learning things, [the non-FSU course] didn’t go into those same things. I don’t know how much of that has to do with it—it’s a community college, so they’re trying to keep it little simpler or if it’s just they don’t see those things as intermediate.” While courses may be focused on the same topic, the content and instructional approach may change from IT program to IT program. This finding may be insightful to the curricula analysis and comparisons being conducted in other parts of this grant project.

Rural vs. Nonrural Differences

The majority of interviewees stated that they would relocate for the right job, especially if the new employer would help pay for relocation. Interviewees expressed that locale would not necessarily deter them if the job and pay were sufficient. Two new professionals preferred working and living in a rural area and mentioned that they were not planning on relocating. For one new professional, nonrural areas were “too crowded.” A few new professionals were in the process of relocating for family and personal reasons.

New professionals who had experience in rural communities frequently mentioned that access to technological and community amenities was a concern. The interviewees perceived that limited jobs, insufficient bandwidth, and outdated equipment were common challenges in many rural areas. The small number of students in rural Chipola College’s IT program had inhibited one new professional’s ability to take courses that they perceived as important because there were not enough students registered for the class to be offered. Many participants (n=8) also reported experiencing a different attitude toward IT in rural communities:

- “I definitely think there’s more IT knowledge in a bigger city.”
- “I don’t believe this community is well suited for a high technical [environment]—what I’m looking for like I want technology, to be surrounded by technology. That’s just me though. I love tinkering with stuff, technology everywhere. In a big corporation would be what I’m looking [for].”
- “There’s [*sic*] always little challenges out in these different rural areas...; they have a lot of um storms and stuff out there and their service goes down and they’ll be without phones or electricity for a while. Whereas at [a more urban] campus, we have everything on a generator.”

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The new IT professionals with experience in rural areas had different attitudes toward those areas. The above findings suggest that rural communities may not have the infrastructure or resources to support IT careers. Similarly, rural areas may be less receptive to or understanding of the benefits IT can bring to their companies and homes.

Preliminary Conclusions

In this study, we interviewed 23 new professionals from three programs in the Florida Panhandle. The phone interviews were meant to capture the new professionals' perceptions about their IT education and transition from being IT students to IT professionals. The interview data was then analyzed by common theme. Across the three different programs, new IT professionals had different interpretations of their education and how well it prepared them for the IT workforce.

Implications for Practice

Some of the interview participants stated that everything they learned was important and that their coursework prepared them well for their jobs, while other participants were critical about how well classroom teaching can prepare students for the IT world due to the lack of hands on training. All participants agreed that internships were a strategy schools can use to increase hands on training in their IT programs while preparing students better for the IT workforce. This finding has important implications for program administrators as well as for students because it suggests that program administrators are well advised to build and maintain connections with local employers who offer internship opportunities and that students should be advised to include internships in their educational experience.

When researchers have examined the potential value of internships for undergraduate IT students based on three main stakeholder groups: students in computing disciplines, IT employers, and postsecondary academic institutions (Galloway, et al., 2014; Ralevich & Martinovic, 2010; Venables & Tan, 2009), they found that internships give students the chance to develop a wide range of soft skills in a workplace environment. Researchers have also demonstrated that internships allow students to increase their employability by gaining hands-on experience with the technical skills (Vairis, Loulakakis, & Petousis, 2013) as well as by providing students with opportunities to develop career goals or determine suitability for particular jobs before they enter the workforce (Shoenfelt, Stone, & Kottke, 2013; Vairis et al., 2013). Researchers have shown that employers also benefit from internship programs because interns often offer a fresh, perspective and are more likely to be familiar with the latest technology (Galloway et al., 2014). Academic institutions that offer internship opportunities are well-positioned to offer a curriculum that meets the needs of the IT industry (Ralevich & Martinovic, 2010).

The data gathered from the new professional interviews aligns with these studies as the interviewees strongly stated that interpersonal skills and soft skills were some of the most important skills needed on their job. However, these interpersonal and soft skills were not always taught in the formal learning activities in IT programs; to this end, internships offer an important complement to the classroom. The findings from these interviews are a crucial part in understanding the student to career pathways of new IT professionals.

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Implications for Further Research

The above findings suggest that experiential learning opportunities such as internships help students to make successful transitions into their early careers, primarily because these new professionals develop soft skills, hone technical skills, and have the chance to network with peers and potential employers in the industry. Since not all of our participants were able to do internships, this poses questions about how IT curricula can be amended to support such activities as well as how IT employers can provide learning and networking opportunities. To answer these questions, interviews were conducted and an online focus group is planned with rural Northwest Florida IT employers to gain their perspectives on the matter.

These questions are particularly crucial in regards to IT employment in rural areas. As seen above, new professionals do not see as much opportunity or potential for careers in rural areas because they may not be ready or receptive to it. As such, the interviews and online focus group may provide insight in how to change these perspectives and provide recommendations for how rural communities might attract new IT professionals.

Following the completion of data collection, the next steps include an in-depth, comprehensive evaluation and analysis that compares the major findings and themes from each data point of this project. This will identify gaps in IT skills education and lead to a better understanding of the potential student to career pathways, allowing us to make recommendations to improve and streamline these pathways by adjusting IT curricula and building partnerships between educational institutions, employers, and rural communities.

Directions for future research may include:

1. What is the range of activities that occur in internships? How do internships relate to formal IT curricula? What makes an internship more or less valuable to a student's learning and future employment prospects?
2. How do students learn about and decided to engage in an internship? To what extent are internship opportunities integrated into curriculum and advising?
3. At what point in a student's program is an internship particularly valuable?
4. How do internship experiences vary given the core business of the internships site, i.e., whether the internship takes place in an IT department versus and IT firm?

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Appendix A – Interview Protocol

Primary Questions for New Professionals

Do you have broadband at home?
What is the IDEAL JOB DESIRED?
Zip code before?
Zip code now?
Relocation possibilities?

Question #1 is looking for all of the participant's education, from high school through your most recent schooling. Also, if the participant stopped and started, please list this and the reasons why. Then please list the topics of study, certifications and diplomas received.

1. Can you each describe your educational background?

Program:

Certifications:

Degrees/Diplomas:

Start and Stops? Reasons?

Question #2 is looking for information about whether the participant used an online/offline process to generate job leads.

2. Can you each describe your job search process? Your most important source? Your method for finding your current job?

Question #3 is looking for the participant to describe what types of **challenges and opportunities** faced while moving from an academic setting to a work environment, especially related to how well they felt their education prepared them for the daily tasks encountered.

3. Can you describe your transition from student to new professional? How did you feel about this transition? Satisfied? Dissatisfied? Other?

Specifically, which skills did you feel you lacked? Possessed?

Which were you able to acquire on your own? Any provided by workplace training?

In answering **Question #4**, please think about those skills most used on the job, no matter how the participant acquired them. Please be as specific and detailed as possible.

4. Describe the skills required for you to successfully function on the job. Remember to identify both technical and general (soft skills) competencies.

Question #5 is looking for details about how education did/did not help as the participant are handles day to day responsibilities, with as much detail and examples as they can provide.

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5. Describe how your education prepared you for the challenges you face on the job. Can you think of some examples of school experiences that prepared you for these challenges, including internship and other activities?

Question #6 seeks to describe differences that may be present between rural and non-rural job settings.

6. If you have worked in both rural and non-rural environments, can you describe the differences between metropolitan and nonmetropolitan job environments? (ONLY USE THIS QUESTION IF APPLICABLE DURING THE INTERVIEW)

Many situations still occur in which IT technicians are instrumental in rolling out broadband to new areas or in helping others use high speed Internet for the first time. **Question #7** is looking for details on any experience, if any, that the participant may have in helping install, help others to use or use for their own needs, high-speed Internet.

7. Describe your experience with IT/broadband (high-speed Internet) deployment.

Question #8 is looking at the overall skill set one needs when using or helping others to use high speed Internet (broadband).

8. Describe the skills needed to be successful in your career related to IT deployment and use.