

Women & Minorities in the IT Workforce

Focus Group Report

The Policy Research Institute at the University of Kansas conducted four focus groups with current information technology workers in the greater Kansas City region. The focus groups were held at the University of Kansas Edwards Campus in Overland Park, Kansas. The purpose of the focus groups was to explore why so few women and minorities enter the IT field. Findings from the focus groups will be used to frame the questions for a later survey of IT workers in the region. Specifically, the focus groups sought to answer six important questions:

1. Why do people choose IT careers?
2. What does the path to an IT career look like?
3. How important is education to career selection and at what levels? (If important, what courses/subjects are most important?)
4. What are the barriers to IT careers?
5. What role do/should mentors play in encouraging IT career paths?
6. Are the answers to these questions different for men, women, and minorities?

METHODS

One focus group was held in November 2002 and three were held in December 2002. All were held at the University of Kansas Edwards Campus in Overland Park, Kansas. Focus group participants included current male, female, minority and non-minority Information Technology workers from the Kansas City metro region. Each focus group included 5 to 9 participants and lasted approximately two hours. Table 1 provides a breakout of participation in each group.

Table 1
Focus Group Sessions

Focus Group Participants		
DATE	GROUP TYPE	PARTICIPANTS
Nov. 14	Women (1 African American)	5
Dec. 3	Mixed (3 women (1 Hispanic), 4 men)	7
Dec. 12	Men (2 Indian)	9
Dec. 17	Women (1 African American)	8
	Total Participants	29

Participants were recruited as follows:

- q Dave Richter and Susan Catts provided the project's principal investigator with a list of contacts, including current male and female IT workers in the Kansas City metro area. (This list also included minority IT workers.)
- q The PI sent an introductory message to all potential participants outlining the project and focus group details. Interested persons were asked to contact the PI.
- q Graduate research assistants contacted interested persons via e-mail and/or telephone to schedule participants

for specific sessions.

- q Reminders were sent to scheduled participants the day before their session.
- q A stipend of either \$50 or \$75 was provided for each participant. One participant declined payment because she preferred to re-invest the funds in the project.

Each focus group lasted approximately two hours. The focus group protocol remained largely unchanged throughout the four sessions. However, minor adjustments were made to gain more specific insight in subsequent sessions and based on the composition of the group. The protocol is included as Appendix A. One PRI focus group facilitator and two project team members were present at each session. Each session was tape-recorded and project team members took notes. The facilitator analyzed the results and wrote the report.

Report Contents

This report summarizes the overall findings, organizing the results topically, including discussions of similarities and differences between participant types. The report includes many verbatim quotes illustrating the various participant points of view.

Care should be taken in generalizing any focus group findings, since the groups are too small to be representative of the general population.

FINDINGS: PARTICIPANT CHARACTERISTICS

GENERAL DESCRIPTION OF THE GROUPS

Sixteen women participated in three focus groups. Two groups included just women, while another group included three women and four men. The two all female groups differed in that group one was composed almost entirely of current or past IT entrepreneurs. The exception was a corporate project manager/developer. Group two was composed almost entirely of corporate IT workers. The exception in group two was an academic administrator with oversight of IT operations at her institution. Previously, she had worked in the technical side of IT. Several other women in the second group were IT managers with technical backgrounds. One of the women in the mixed focus group was an entrepreneur and the other two worked for private corporations in technical capacities. Three minority women participated, one in each of the three sessions.

The thirteen male participants were split between two sessions. Nine of the men participated in an all male focus group while the other four men participated in the mixed group with three women. One man was a retired entrepreneur, one participant worked at a community college, and the others worked for corporations. Among the corporate workers, there was a fairly even mix of technical and management level workers. Two of the participants in the all men's group were minorities.

Generally, all the participants seemed very bright, articulate, well-educated, and self-motivated. Many indicated they had a love of reading and/or a love of learning. They were likely to describe themselves as logical or analytical. Most stated they loved challenges or problem solving.

As a group, the women appeared more outgoing than the men, particularly the women entrepreneurs. The women appeared unwilling to allow barriers of any type stand in their way. Instead, many spoke of making specific choices that allowed them to strike a balance in their lives. They appeared determined and self-assured and seemed to have high standards and expectations for themselves and others. All of the women were likely between ages 30 and 60, with most falling in the 40-55 range.

The men were a mix of both outgoing and introverted personalities. Generally, the younger men were less outgoing and less outspoken than their older male counterparts. Also, the men seemed less introspective than the

women and a few of the older men seemed egocentric. The men's ages varied widely, as they were likely between ages 20 and 60, with the distribution being fairly even among the participants.

Compared to their non-IT peers, the men believed they were more logical, more analytical, and better educated. They said they want to know how and why, while others are more generalists and interested in the big or overall picture. They said that some of them are less interested in social activities than others outside IT, but they offered their introverted personalities as a possible explanation. Like the women and minority participants, they believed IT workers inherently enjoy doing and learning new things. Other words the men used to describe themselves included creative, open to change, musical, strong problem solvers, and flexible.

Overall, there were five minority participants. Two minority participants were males from India and did not make it readily apparent they identified themselves as minorities. Similarly, the female Hispanic/Latin American participant did not outwardly indicate herself as a minority. The two African American female participants acknowledged their status as minorities.

Both African American women demonstrated a high degree of self-determination and drive. Additionally, they did not focus on their status as a minority and did not acknowledge it had been a specific barrier for them.

LENGTH OF EXPERIENCE IN IT

Nearly all the female participants had 10 or more years of experience in the IT field, with many having 15-25 years experience. The range was 1 year to around 30 years.

The men had a range of experience in the IT industry from about three years to 30 years. Most had been in the field for 10 to 15 years. Three participants were very early in their careers, including the two minority participants.

EDUCATIONAL CHARACTERISTICS

Most of the women were self-taught and came into the field by way of another career path such as general office/clerical positions, the Navy, geography or architecture. Many of these same women were considered the "go-to person" for tech questions early in their non-IT careers and found they had a natural aptitude for IT, which led to their career path. One woman called it the "path of least resistance" and other women described their paths similarly. However, there were six women who studied computer science in college and consciously chose the career path. One woman's parents chose her computer science major for her and she stated she is very happy with the choice. Only one of the six female entrepreneurs majored in computer science. Further, none of the female entrepreneurs admitted their high school coursework in math, science, or computers had influenced their career path.

Several men came into the IT field from other careers, with a few coming from engineering and another from architecture. One had a military background. Another had been an artist and saw a close relationship between creating artistic pieces and programming. Others, like many of the women, had stumbled into IT as a result of being the "go-to person" in their organizations for technical questions. Another man experienced the difference technology could make in his ability to do his job more efficiently and was sold: he converted an Excel spreadsheet that took a month to generate into an Access database that produced what he needed in 35 seconds.

At least half the men, especially the younger participants, came directly into the IT workforce and had studied computers or a related field in college. The younger men were also more likely to have been influenced by their high school coursework. Several men mentioned they had high aptitudes for math and/or science and came to the IT field as a result. The two men from India took high school programming courses. One of these men had to take

an aptitude test in the eighth grade in order to take the high school programming courses.

Table 2 shows the breakdown of participants who majored in computer science or a related field. While the sample size is much too small to be generalized for the participant populations, the results are interesting and suggest the need for further exploration of the topic. From this limited data, it appears that women in IT careers are more likely than men to come to IT from another field or course of study. Further, only one of the six women entrepreneurs majored in computer science, suggesting that women who major in computer science are likely to pursue corporate positions, while those who come to IT from another field are more likely to be entrepreneurs.

Table 2
Computer Science Degrees

Computer Science (or related) Major			
	YES	NO	NO RESPONSE
Women	6	9	1
Men	7	5	2
Total	13	14	3

Participants were asked if high school courses in math, science or computer science were important in influencing their career paths. The results are in Table 3 and suggest the need for further exploration of the topic. Although the sample size is too small to be generalized for the participant populations, the results suggest high school math, science, and computer coursework may have little influence on either men or women. Few participating women acknowledged it as a factor. However, taking computer science courses in high school appeared to have a positive effect on the younger participants' IT career paths.

Table 3
High School Course Influence

High School Math, Science, or Computer Science Courses			
	YES	NO	NO RESPONSE
Women	3	13	0
Men	5	7	1
Total	8	20	1

EXPOSURE TO COMPUTERS

Most participants were in college before they had significant exposure to computers. Most of the younger male participants grew up with computers either at home or in school while only a few older participants did so. Many of these participants were naturally drawn to computers for entertainment or personal enjoyment. Some said they had LAN parties and others just programmed because it was fun.

FINDINGS: IT CAREER FACTORS

ROLE OF MENTORS

When asked specifically about the role mentors had played in their career development, few acknowledged such a role as being significant. However, during the course of our sessions a number of participants talked about other

influential experiences where they had been encouraged by or assisted by someone along the way.

One of the women entrepreneurs was an African American who was mentored by a co-worker during the early stages of her career. She was very grateful for the experience, which not only allowed her to explore her interests in the field but also gave her a tremendous amount of knowledge. She said the mentor was very patient with her and also very encouraging. Some of the other women said they were in the field so early that there were no mentors.

Another African American woman had a high school guidance counselor who identified her aptitude for technology. The counselor insisted she and other girls take technical courses in high school.

She was determined the girls would take the “boy” classes. She went through the student files and picked those she thought would be good in those classes. She would change class schedules and sign you up for electronics or whatever and wouldn’t let you drop.

Some women found encouragement and inspiration in family members, such as a father who taught his daughter programming, a mother who became a CPA when “women didn’t do that,” and brothers who were in engineering. The Hispanic woman decided to study IT because her brother was already an electronic engineer working in networking.

The men had similar mentoring experiences. One young participant was encouraged to pursue IT by his high school teachers, who saw he had an aptitude for computers. He said they helped him get into a Kansas City technical school while he was still in high school. Several were encouraged to pursue IT careers by parents, teachers, or guidance counselors. One participant found inspiration in watching his older sisters: He noticed one sister having a lot of early success in her IT career; meanwhile, his other sisters in non-IT careers were struggling.

Although few participants stated mentors had played a significant role for them, all four focus groups recommended mentors as a way of encouraging women and minorities to pursue IT careers.

CAREER SATISFACTION AND LONGEVITY

All the women and men who participated in the focus groups said they planned to remain in the IT workforce. However, some of the corporate IT workers feared that the economic climate in the region could force a career change.

The women stated overwhelmingly that they loved working in IT. They said they enjoy the everyday challenges, problem solving, learning new things, creativity, and logic of the career. In addition, the entrepreneurs said they appreciate the flexibility. Many women said they fell in love with the career because they enjoyed the novelty of doing ‘cool things’ and helping others do their jobs more easily.

It used to be “I did that really cool thing.” Now it’s much more rewarding to get the e-mail that says “man, that thing you did really saved my ass.”

I think human beings should do the jobs that human beings are good at. Make the decisions and absorb the info, and do that. If you can help someone do their job more efficiently, cut four hours out of their day...It’s like getting paid to play. It’s like a game.

Like the women, the men all planned to remain in IT for the duration of their careers. However, unlike the women, most stated that their roles and capacities were likely to change over time. Some were currently in management positions and hoped to move into more technical areas. Others were in technical positions and saw management as their next career step.

The all men's group talked a lot about how much technology would change in the years to come. Like the women, they said they enjoyed the challenges and ever-changing environment in IT and believed it was a factor important to their career satisfaction. One participant offered this analogy: the cutting edge of anything is like the Conquistadors, and the mid to late 1970s were like the time of the Conquistadors.

For a few women, the income potential had been an initial reason for pursuing the career because they were single parents. But neither the women nor the men stated money was a reason for loving IT or for staying in the field. Still, the women stated income potential as one reason young women *should* consider a career in IT. Overall, this man's statement illustrates what most participants seemed to believe:

I find that those who are successful in IT are the ones who love IT. Those who are in IT because of the money are miserable and they don't tend to be successful.

CAREER DOWNSIDES AND BARRIERS: TIME DEMANDS

Although all participants plan to stay in the IT field, many admit there are certain downsides. Long working hours or being "on-call" day and night top this list for both men and women.

Both men and women recognized that the long hours could make the career difficult for women with families—especially in the corporate setting. In fact, this constraint was a prime reason many of the women entrepreneurs left the corporate world to form their own companies. They found that as entrepreneurs, they have the freedom to set their own schedules. Through their own organizations, they were able to develop a successful IT career while maintaining enough flexibility to satisfy their family commitments.

It depends on you and your desires and your picture of what your life should be. Other women seek out part-time positions in family friendly companies. You don't have to accept the culture as it is. (This entrepreneur took her children with her on consulting jobs whenever she could.)

Ironically, even though much IT work can be performed from remote locations or independently of others at off times, both women and men said managers still seem to link productivity to the amount of time they physically see workers at the office. While some women chose to leave the corporate setting to start their own business, one woman sought work in the academic setting and another left the corporate setting temporarily, until her children were grown.

If I had to work in a situation where I had to miss one of my kids' soccer games... Part of the reason I'm in academics is because I've never had to miss anything. And, no, I don't make the kind of salary I could make in industry, but you know what, that's the trade-off I chose. It [academia] has it's own set of problems. It has its own glass ceiling. But you see your family.

I did leave because I did notice that I'm not getting the opportunity to be the kind of mother that I should be. I don't want to see my child on the news or anything like that. I don't want some social misfit. I want them to move on to do what they should do as responsible citizens. Not the drug dealer. I don't want to bury my children. And so I walked away from \$93,000 to make \$9,000. But it was my decision. I didn't miss anything. My kid's in the Naval Academy and I'm pretty proud of him.

The men were also concerned about the long hours an IT career can require. For some, it was about balancing their social lives with their careers and for others, their concern was having enough time with their families.

If you're not careful, a technology career can kill your social life. You need a good balance between career and personal life. I missed a good deal of [my kids'] baseball games and I can't get that back.

I have friends that work 60 to 70 hours a week but don't have a personal life. I wouldn't sacrifice my

family life for my career.

A few men were determined not to let their careers take over. Instead of staying late, one father said he goes back to work from 9 to 11 p.m. so he can spend evenings with his family. Another (single) participant said he works hard to keep the balance in his life because he doesn't want his career to be his life.

One man believed some people don't want the social life and choose the long hours. Another said he watched his friends get burnt out on their IT careers because of the long hours and lack of balance in their lives.

CAREER DOWNSIDES AND BARRIERS: GENDER ISSUES

The women entrepreneurs said the gender barriers to IT careers were no more, and perhaps less, than those in other fields. One participant called the barriers self-imposed. They argued that "tech is tech," either you know it or you don't. They believed that once you proved you knew IT, it didn't matter if you were a woman. They also suggested that since IT is a relatively new field, the "good ol' boy" network has not had a chance to develop as it has in other fields, thus leveling the playing field for women and minorities.

Once you get in, everything's pretty equal. There's no discrimination. It's the ideas you bring to the table. It's not who you are. It's what you know.

We [IT workers] love to problem solve and we don't care who's on the other end of the conversation.

Despite the above statements, most entrepreneurs pointed to blatant instances when they had encountered gender barriers. But they also noted that management and external (non-tech) entities/people seemed to be the sources of such barriers, suggesting that the traditional gender barriers still exist outside the purely technical arena.

Several women had encountered non-tech people who had difficulty acknowledging and accepting their competency in the technology field because of their gender. For example, one African American entrepreneur encountered a group of male executives who never were convinced she was more than a figurehead. Despite her ability to answer and address their technology questions, they still looked first to her male assistant for answers. She and the other women entrepreneurs seemed generally unfazed by this behavior, as if they have accepted this reality.

The perception is that women and/or minority owned businesses are either substandard or really owned by, run by men. Women are just the 'fronts.'

The female corporate IT workers stated that male dominance in the field was a barrier. They also believed they had to work harder to prove themselves to their male counterparts. Given that many of these corporate IT workers have more management-oriented positions, it seems to support the women entrepreneurs' argument that management/non-tech entities impose at least some of the gender barriers to IT.

For me, starting out, it was 99 percent male. No female management. It was hard to get opportunities. You had to work twice as hard just to have the opportunity to be a computer operator.

I think the culture that is inherently in IT has caused a number of women to leave the field. It's still a little this way. It tends to be a little exclusionary. Communication is very little and it tends to have an edge to it that is a little discriminatory or discouraging.

It can be intimidating to be the only woman in the class or at the conference.

Whenever I talked about the project, it was "we." Whenever he talked about the project, it was "I."

They see us as a second job. 'It's nice she has a job, but the man needs the money.'

Men are still running this country.

Generally, the men in the all male focus group did not seem to believe the barriers to IT were any different for men, women, or minorities. They struggled somewhat with this question, but offered many possible explanations:

Women don't go into the career very much. The ones who go into it are really, really good, but they end up going into management. So, they don't really stay in the field.

I think it's by choice. I see no reason why not.

The perception may be that it's a man's career.

Some are not brought up with the idea that the sky is the limit. The rest of it is choice. What is the limiting factor for women? It's not vision. It's choice.

They also suggested that the high time demands of the career might clash with women's values, conditioning, or culture.

I think it's a cultural difference. Certain cultures/religions—women are to take care of the home. Men are to take care of and provide for the family.

My wife works, but she comes home. I work but sometimes I get wrapped up and would rather stay and work through whatever I'm doing. I'm not thinking, 'it's 5 o'clock, I need to get home and take care of the children.' Women probably have a better sense of home and family.

If you're a female and you're going to raise kids, you don't want to spend 60 or 70 hours a week doing computer work.

One participant stated that the women in IT careers are underpaid. But at least one man thought more women would go into IT in the future.

I think it's evolving and I think more women will go into it. It's like sports. When I was in high school, it was men who played sports. I think it's just evolving.

CAREER DOWNSIDES AND BARRIERS: MINORITY ISSUES

The African American entrepreneur was particularly frustrated by the lack of other minorities in the IT workforce. She hires a number of IT staff and has been disappointed by the lack of interest in IT careers by other African Americans. She stated that her counterparts lack self-discipline and determination and have self-imposed barriers preventing them from pursuing what she considers a great career.

Out of all the resumes that have come across my desk, I've probably hired two African Americans and they really didn't have the skill sets, but I was willing to mentor and train them. But they did not have the motivation. In the IT field, you've got to be motivated. You can't just get in because you make a lot of money. I try to encourage minorities to go into the field, but I don't encourage them because they are a minority. Basic question: 'Do you like computers?' Because if you don't like it, don't waste my time. I have no time for micromanagement. For me, being in the minority community, a lot of them believe IT is just for the smart people. Yes, you have to be logical. You also have to be a trouble-shooter... A lot of them believe if they fail at it, they are not good at it. It's ok that it doesn't work today, but you have to keep going at it. You have to keep pushing.

In the mixed group, one man suggested that the good ol' boy network created barriers for both women and minorities. He stated that men still talk about sports, especially football, when they gather in small groups.

Minorities (from other countries) talk about football...but they mean soccer. There's a strong bias for guys like me (white American men).

One participant said that economic barriers might decrease opportunities for minorities because their schools may lack resources or because their exposure to computers at home may be limited. Some seemed to agree with that observation. Others suggested there are differences between minority groups.

The Asians have more of a push towards education and technology. Americans are more in the middle. Hispanics and blacks have less emphasis on education.

Ethnic people who come into the U.S. from outside the country seem to be more driven.

My perception of some international minorities is that they are very smart...There can be problems with communication (language barrier), even though they have good technical skills.

There's more pressure to succeed if you come to the U.S. from another country because it's a condition of staying in the U.S.

One participant from India agreed with the last statement above but said there are people in his country who "don't do anything."

We are sending the best from our country to the U.S.

RECRUITING WOMEN & MINORITIES: PARTICIPANT RECOMMENDATIONS

The groups developed a wide range of tactics for addressing the shortage of women and minorities in the IT workplace. All four groups focused almost entirely on females in their discussion. The plans were not highly formalized but do offer a range of potential solutions and tactics. Each group's individual responses are included as Appendix B along with an overall summary of the recommendations that clusters the groups' similar responses together.

When discussing how to increase the number of women and minorities in the IT field, both female groups suggested mentoring. The entrepreneurs suggested shadowing as well, while the corporate IT workers wanted to see various types of mentors involved at multiple stages along the career pathway, beginning in grade school and continuing through the first IT job. They felt it was important for girls to have contact with successful female IT workers to make them aware it is not just a career for men and to also showcase the range of IT career choices.

The entrepreneurs suggested going "where the girls are" with aptitude tests and other developmental programs. Stores in malls, such as Claire's Boutique, were among the suggested venues for getting girls' attentions. They believed that there were misconceptions about what IT workers do and felt it was important to share the facts. They also wanted to point out to girls that there are big advantages for mothers in IT careers due to the flexibility it offers.

To survive and thrive, the corporate IT workers said a better support system with their peers was needed in the IT field.

It's not just getting them into the career. It's how you manage up. How you survive. How you manage laterally. How you manage home and family.

They believed it was important to start early (grade school) and encourage girls in math and science. They suggested that girls should not have the opportunity to opt out of key math and science courses along the way. They advocated requiring certain critical math and science courses so that girls aren't left behind by default before they understand the opportunities that are available in IT careers.

When the men were asked how to get more women and minorities into IT careers, most of the discussion focused on helping women and girls. The men's group suggested that in order to get more women involved, the workplace may need to change. Opportunities to work at home, flexible work hours, flexible leave policies, and on-site daycares were ways they thought companies could demonstrate they appreciate and respect motherhood.

The men stated it was important to dispel the myth that high levels of math skills and attention to details are necessary since numerous career paths are available in IT. But they also wanted to help girls and women move past thinking that math and science are difficult. These efforts should begin in early elementary school education, they said. Another person suggested offering opportunities for women to receive training and college credit while still in high school at either a technical school or a junior college.

They suggested counselors, local businesses/industry leaders, women in IT, parents, and mentors were all key people to involve when trying to encourage women and minority youth to participate in IT careers. They said that some of those involved should have similar backgrounds to the students with whom they will work. They also wanted dedicated websites for women about IT careers.

Generally, the men were against a quota system for the IT workforce. After discussing ways to increase the number of women and minorities in IT, one participant stated the following:

I question the value of quotas: 'We need more women...we need more minorities...' I think what's more important is that we eliminate the barriers, regardless of who they effect and try to get past this segregation of our society... Well, what about my grandsons? Somehow we've got to get past this mentality of counting heads and start eliminating all barriers. Quit pitting groups against each other.

GROUP DYNAMICS & OBSERVATIONS

During introductions, both women's groups stuck to the topics set before them, as did the mixed group. However, the participants in the all men's group spent a large amount of time detailing their life accomplishments, including those unrelated to work. Several mentioned the number of grandchildren they had and one discussed his debt-free financial status and recent home remodel.

Regarding the Hispanic woman in the mixed focus group, it was observed that her responses were frequently ignored or not responded to by the other participants, both male and female. In some cases, other participants made statements similar to earlier remarks by her, which had gone unacknowledged.

All four groups paused when asked about barriers. The men in the all male focus group appeared somewhat puzzled when asked to identify barriers to IT careers for women and minorities. However, after considering the question, they identified some possible explanations but were generally reluctant to say there was discrimination or a gender bias.

When given the task of developing a plan for addressing the shortage of women and minorities in the IT workforce, the first group of women spent a fair amount of time re-ordering the moderator's stated topics to be covered by their plan. To their credit, the entrepreneurs were the only group to actually complete the task of developing a plan to address the issue. They used a methodical approach to the problem statement and developed their plan point by point. The other groups were much less formal about their discussion procedures.

SUMMARY OF FINDINGS

Among all participants there was a wide range of experience but most had been in the IT field for 10 to 20 years. Some had only a few years of experience while others had 30 or more years in the field. Six of the female participants were entrepreneurs, while most all of the men worked in the corporate setting. One man was a retired entrepreneur.

Nearly everyone agreed they loved working in IT and imagined staying in the field forever, but perhaps in different capacities and levels. Some of the corporate IT workers were concerned that lay-offs could force them to pursue another career path in the competitive Kansas City job market.

Logic, love of learning, creativity, good problem solving abilities, open-mindedness and a love of challenges were all traits most everyone said were important in the IT field. Many of the women also stated they felt a great deal of satisfaction from helping others.

Participants came into the field from many different points. Quite a few came directly into IT from high school and/or college. A number of others discovered they had an aptitude for technology while working in another field. Math and science courses at the high school level were more likely to have been a factor for the men than women, though this was not exclusively true and even still, it was the case for a small number of men. A few men and women had been able to take technology and/or programming classes in high school, which seemed more beneficial to their careers.

Mentors, counselors, teachers and parents were the source of inspiration and assistance to some participants. In a few cases, it was a fellow employee who took the participant under his or her wing to nurture their interest in technology. In other cases, it was a teacher who recognized a student's natural abilities and encouraged further development of the skills. For some, they were among the pioneers in the field, so there was no one to mentor them. All groups mentioned that having mentors would be a positive approach to encouraging women and minorities to pursue IT careers.

The long hours required and/or expected of many IT workers was the most frequently mentioned barrier to IT careers. Men and women both had concerns about this. Neither group liked the time it took away from their personal lives, including families. This was a factor in some of the women's decisions to start their own companies. Men and women alike understood this was a huge barrier for anyone with a family, but especially a woman. Some men considered it a choice by women and other men said it was a cultural difference between men and women.

The corporate women and the men both recognized that the workplace must change in order for an IT career to be more attractive to women with families. They said corporate daycares, more flexible schedules, telecommuting options, and less restrictive leave policies could all improve the situation for women who are mothers. The entrepreneurial women had altered their reality by leaving the corporate scene and creating an environment that allowed them to have a successful career and family.

In technology, women said there were fewer biases against women because the field is so knowledge-and skill-based. The men they work with are accepting of them because they are competent. However, women noted it was still not always easy to be a female in the workplace because management and corporate politics come into play. They explained that those outside the technology field (even technology managers) were often still part of the 'good ol' boy' network. Several entrepreneurs had encountered situations with potential clients or others who didn't accept them as experts.

While the men recognized some of the barriers for women and minorities, they also believed it was about choice. They did not seem to acknowledge the role men might play in influencing that choice. Not surprisingly, they were

somewhat out of tune to the environment women face in the workplace. Some men felt that for minorities, there was a difference among group types. They suggested economics could play a role in limiting opportunities for some groups.

There were only five minority participants. The two African American women stood out as very determined, focused individuals. None of the five had responses that differed significantly from those summarized above. The African American entrepreneur was extremely frustrated with the lack of other African Americans in the IT field, but she believed it had more to do with the motivation of those individuals than anything else. The two men from India had started on their IT career course in early high school. The Hispanic woman followed in the footsteps of her brother. She and the men from India believed IT was a very difficult career for women with children to pursue because of traditional family demands. The two African American women acknowledged the difficulties of raising a family while balancing a career, but they both had made choices and sacrifices that helped them persevere and enjoy success in both venues.

APPENDIX A

Focus Group Protocol Information Technology Workers

- Participants: IT workers in the KC metro area.
- Locations: KU Edwards Campus, Regents Center,
12600 Quivera Dr., Room 311, Overland Park, KS
November 14, 8:00-10:00 a.m. (women)
December 3, 2002, 4:30-6:30 p.m. (mixed)
December 12, 2002, 8:00-10:00 a.m. (men)
December 17, 2002, 4:30-6:30 p.m. (women)
- Recruitment: By telephone with confirmation and reminder via e-mail. Original list of names received from Dave Richter & Susan Catts.
- Purpose: To discover why some bright and intelligent people go into and stay in a career in the field of information technology (IT) while others go into this field but leave, and why others never go into the IT field at all.

A. INTRODUCTION (15 min.)

1. Introductions: moderator and assistant
2. Explain the idea of a focus group. Research is being conducted by KU under a grant from the NSF. Today we hope to gain some greater insight into IT workers' views.
3. Introduce the topic for the session: To discover why some bright and intelligent people go into and stay in a career in the field of information technology (IT) while others go into this field but leave, and why others never go into the IT field at all.
4. Guidelines for participation
 - Speak one at a time
 - Speak so that everyone can hear you
 - Do not hesitate to disagree with other; there are no right or wrong answers
 - I may need to interrupt from time to time to keep the discussion on track.
5. Introduction of participants
 - So that we may all get to know each other a little better, let's begin with each person telling their:
 - Name
 - IT Job Title
 - Company
 - What you like to do when you're not working

B. WARM UP – YOUR IT BACKGROUND AND FEELINGS (10 min.)

1. How long have you worked in IT?
2. How long do you think you'll continue in this field?

Points to be covered:

- Is this a lifetime career?
- What will keep you in IT?
- What are some reasons you might switch careers?

C. CAREER INFLUENCES (15 min.)

1. How did you end up working in IT? (Did you come to IT from another career?)

Points to be covered:

- Early exposure to math/science, computers? (aptitude?)
- Encouragement from teachers, parents, friends, family?
- Mentor influence?
- College/high school course work?
- On-the-job training opportunity
- Career opportunities

PROBE: Were there specific classes in high school (programming, computer science, or math) that were especially important in preparing you for your IT career?

PROBE: What part of your academic background was most important in developing the skills you use in your work?

PROBE: When did you first use a computer and for what types of things?

2. Looking back, what event or experience had the most influence on your decision to pursue an IT career? Describe it.
3. Did any person have a significant role in your decision to pursue an IT career? (Who was the person and what role did they play?) (Did you have a mentor or role model while in school?)
 - Parent, family member, friend, mentor, role model

D. BARRIERS TO IT (20 min.)

1. With every career field there are certain obstacles to overcome. What are the barriers to a career in IT?
 - Of those, which are the most important (significant/biggest)?
2. How did you overcome the barriers?
3. Is an IT career more demanding than other careers? If yes, how?
 - Is this a good career for someone with a family? Explain.

E. WOMEN and MINORITIES IN IT (20 min.)

1. Fewer women and minorities enter the IT field. Why do you think that is?
 - Let's start by talking about women...
 - Are the barriers different for women?
 - What are the most important barriers for women?

 - Now let's talk about minorities in IT...why are so few in the IT field?
 - Are the barriers different for minorities?
 - What are the most important barriers for minorities?

 - Consider:
 - Ø Culture of IT departments
 - Ø Higher standards for women and minorities?
 - Ø (Mis)Perception about career/work
2. WOMEN ONLY—What separates you from other women who are not in the IT field?
 - Do you feel you are different from other women? If so, how? (personality, work style, emotionally, etc.)
 - Do you have difficulty “fitting in” at work? Describe.
3. MINORITIES ONLY—What separates you from other minorities who are not in the IT field?
 - Do you feel you are different from other people of your heritage? If so, how? (personality, work style, emotionally, etc.)
 - Do you have difficulty “fitting in” at work? Describe.
4. MEN ONLY—What separates you from your contemporaries who are not in the IT field?
 - Do you feel you are different from other men? If so, how? (personality, work style, emotionally, etc.)
 - Do you have difficulty “fitting in” at work? Describe.

F. WRAP UP (30 minutes)

1. Due to concern over the lack of women and minorities in the IT workforce and given your knowledge of the issues, you have been selected to serve on a special task force for increasing the number of women and minorities entering the IT workforce. The overall strategy is to target junior- and senior-high youth and the goal is to double the number of women and minorities in IT in 10 years. However, significant results toward the goal are expected by fall 2004. Discuss how you would address the problem and develop an action plan.
 - The plan should include:
 - Ø Steps to take
 - Ø Factors important to influencing female and minority youth
 - Ø Key people/groups to involve in the plan
 - Ø Specific educational and experiential factors to address
2. Thank you very much for your time today. Your participation has been very helpful to us. Before we go, is there anything we have missed?
3. One final question (IF TIME): We will be using your responses today to help us develop a survey of IT workers in the KC metro area. Would you prefer to be surveyed electronically, via the web; by phone; or by mail? Would you be able to complete the survey at work?

APPENDIX B

Participant Recommendations for Recruiting Women and Minorities

Summary

All four groups suggested the following:

- ü Provide better clarification about IT careers to dispel common misconceptions about the field. This discussion included the need for presenting the wide range of IT careers and for outlining what skills and aptitudes are truly needed for success.
- ü Highlight the benefits of a career in IT.
- ü Provide mentoring opportunities, including career explorations.

Three of four groups suggested the following: (Note: The group that did **not** mention the topic is noted in parenthesis.)

- ü Utilize aptitude tests as a way of identifying students who may have a natural talent for technology-related careers. (All Men)
- ü Encourage industry to change and become friendlier toward female IT workers. (All Women, group 1 (entrepreneurs))
- ü Involve technology, industry and/or community technology leaders in encouraging women and minorities. (All Women, group 2)
- ü Involve parents and counselors in the process. (All Women, group 1)

Two of four groups suggested the following: (Note: The groups that mentioned the topic are noted in parenthesis.)

- ü Find out students' interests and then show how these interests tie in with IT careers. (All Women, groups 1 & 2)
- ü Boost math and science education. Target women (and minorities) with these initiatives and begin early. (All Women, group 2; All Men)
- ü Involve existing groups for children and youth, such as Girl Scouts and Boy Scouts, to encourage interests in IT fields and to enhance experiences with computers. (All Women, group 2; Mixed)

All Women Focus Group 1

- ü Utilize aptitude tests as a mechanism for identifying youth with the potential to succeed in the IT career.
- ü Utilize technology, perhaps through a touch-screen, high-tech approach, to administer the interest/aptitude inventory.
- ü Set up the interest/aptitude inventory program and other activities in locations girls are likely to frequent. Examples include Claire's Boutique and other similar stores located in shopping malls.
- ü Educate students on what an IT career is all about. Clear up misperceptions about the field. Show that IT workers are not "just a bunch of code-heads."
- ü Offer career exploration opportunities: Partner youth with people in those fields.
- ü Find out what the students' interests are and then relate those interests to IT fields.
- ü Develop a mentoring program
- ü Show that an IT career offers flexibility, even the ability to work from home
- ü Show that an IT career offers the opportunity to make a great living
- ü Involve local technology industries, large and small.
- ü Involve community (female) technology leaders such as Susan Catts.
- ü Hold career days and demonstrate what IT careers really are.

- ü After one cycle, do an evaluation of the program, solicit feedback, and make necessary refinements to the program.

All Women Focus Group 2

- ü Convince employers to offer a pleasant, hospitable environment for people to invest the time, energy, and education for the career.
- ü Create a support network for women and minority IT workers.
- ü Develop a mentoring program. Include business professionals, big brother/big sister type program, and different types of mentors at different stages along the pipeline because students have different needs at different times. Continue mentoring when students are ready to enter into the workforce.
- ü Educate women and minorities on understanding “gamesmanship.”
- ü Highlight opportunities for starting your own company. Include information about how to do it and provide resources.
- ü Develop a network of investors for women and minority entrepreneurs interested in starting their own company.
- ü Make some math and science courses required for all students.
- ü Also make those courses more interesting through creative teaching.
- ü Consider all girl classes or even all girl schools.
- ü Educate parents and counselors on the opportunities in IT and computer science so they can make sure students stay on track with high school coursework. Include teachers so they can better instruct and nurture talented and interested students.
- ü Identify students with technology (math/science) aptitudes so kids with [natural] abilities are given the opportunities/information.
- ü Increase the knowledge base for career paths and opportunities.
- ü Work on self-esteem.
- ü Look into the Explorer Post (Boy Scout) program, which is co-ed, which includes an IT/computer science component. Consider a similar program for girls.
- ü Include the Kansas City area “Science Pioneers Group” in planning and programming.
- ü For minorities: Show students the relevance of math, science, and technology and how it can be used. (Show why it’s important.)
- ü Take the “geekiness” out of IT careers and make it “cool and sexy.” Make it look fun.
- ü Emphasize the creative side of those opportunities.

All Men Focus Group

- ü Show women the benefits of having IT in common with your spouse, if he happens to also have an IT career.
- ü Point out the benefits of the career and what can be gained.
- ü Dispel the myth that you need high-level math skills and detail skills.
- ü Emphasize that what is needed is logical thinking skills.
- ü Show there are lots of different career paths in IT. Show the diversity in the field and the diverse skill sets needed.
- ü Create a paradigm shift to get women past thinking that math and science are difficult.
- ü Begin working on math and science for women in elementary school.
- ü Get women, mentors, counselors, and parents involved, i.e. women in the industry; people with similar backgrounds to the students; and local companies.)
- ü Develop websites for women about IT careers
- ü Involve companies for “real world” experience, i.e. job shadowing and internships. Have corporate support or sponsors with the high schools.
- ü Involve the Kauffman Foundation.
- ü Develop opportunities for training and/or college credit to be earned while in high school, perhaps through

either a technical school or a junior college. This could include meeting general education course work requirements.

- ü Develop an ad campaign that shows women can balance an IT career with other goals.
- ü Get employers to change. Encourage companies to appreciate and respect motherhood among its employees by offering women the opportunity to work at home, by providing on-site day care facilities, and by allowing flexible work schedules and friendly policies for paid-leave.
- ü Show it's a good career for those who like challenges and opportunities to learn and do new things.

Mixed Focus Group

- ü Encourage students to think less about the earning potential and more about what they like to do and what abilities they have.
- ü Reverse some of the stereotypes. Show women and minorities in marketing campaigns for IT careers.
- ü Emphasize that IT workers have the opportunity to choose a career that allows them to dress how they want and work the hours they prefer/have flexibility.
- ü Show the diversity of opportunities and range of possibilities in IT careers.
- ü Show the reality of IT careers; dispel myths. Show that IT is more than just a few career choices.
- ü Show that creativity and having an open mind are important in some IT careers to appeal to the artists and musicians.
- ü Show that creativity is not a necessity.
- ü Utilize a book series called "Cool Careers for Girls" at appropriate stages. Several books in the series focus on IT careers.
- ü Start educating children about IT careers while they are young.
- ü Expose children to computers when they are young to remove technology fears.
- ü Improve training for teachers in technology instruction.
- ü Develop a mentoring program.
- ü Get corporations to become more woman friendly; provide better benefits for mothers such as increased flexibility, on-site daycares, and other kid-friendly policies.
- ü Develop computer lab camps for Girl Scouts.
- ü Identify groups kids are involved in and encourage participation and leadership by women and minorities in IT.
- ü Get companies to volunteer mentors, perhaps by offering flex-time for employees who participate, or perhaps by donating a specified number of hours per month for volunteering. Involve men, women and minorities.
- ü Involve men to show girls they can be valued in IT just like boys/men.
- ü Offer educational incentives (payment of college tuition) to students who choose IT careers and stay in the field for a specified number of years.
- ü Offer computer courses in high school and require them.
- ü Educate counselors about IT careers and how to properly prepare students for IT careers and IT educational paths.
- ü Conduct logic testing.
- ü Include courses in high school that cover more than just the basics in computers.
- ü Make sure programs are developed in all schools, not just those with the most money.
- ü Remove barriers, but don't necessarily give preferences (affirmative action).