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# **Factors Influencing IT Career Choice Behaviors of First-generation College Students**

*Emergent Research Forum (ERF)*

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## **Abstract**

Information technology (IT) field is a potential source of economic advancement for college graduates, but in the IT workforce the representation of minority student populations is disproportionately low. The underrepresentation of minority students in IT workforce is further compounded by their first-generation student (FGS) status, as Latino and African American students account for the majority of the FGS population. Our knowledge about these underrepresented student populations' career choice behaviors is limited. This qualitative research adopts social capital theory as a sensitizing framework for understanding the influences and the resources valued by the minority FGS in their career choice decisions. A preliminary analysis revealed four influencing factors, including social capital, technical capital, perceived job opportunities, and interests. This research can contribute to expanding the IT workforce diversity and inclusiveness. The paper concludes with implications for IS careers of the FGS population and the next steps of the research project.

## **Keywords**

IT career choice, first-generation college students.

## **Introduction**

A nation's economic growth and technological innovation rely heavily on the advancements in its science, technology, engineering, and mathematics (STEM) fields. Among all the STEM occupations, information technology (IT) is projected to increase by 12.5 percent from 2014 to 2024 (Fayer et al., 2017). IT industry presents a viable source of economic advancement for college graduates, but in the IT workforce the representation of minority student populations is disproportionately low. African Americans make up 11.9 percent of all workers but only 7.9 percent of IT and math workers, and Hispanics make up 16.7 percent of all workers but only 6.8 percent of IT and math workers (Muro et al. 2018).

The underrepresentation of minority students entering the IT workforce may be a function of their first-generation student (FGS) status. Latino and African American students account for the majority of the first-generation college students, who are first in their family to attend college and face the risks of low retention and graduation rates in higher education (Beede et al., 2011). In particular, the FGS background gives rise to barriers for this already at-risk population to considering and choosing IT careers. Yet, it's important to cultivate interest in pursuing a career in IT among under-represented students - to help meet the demand for IT workers, to narrow the economic gap, and to provide a more diverse and inclusive workforce. Understanding how to encourage under-represented students to choose IT career pathways is not only an important societal mission, but critical to the future economic development of our country.

In this paper, we intend to answer this general question: *What influences college students' IT career choice behavior, especially students who are first in their family to attend college?*

To address this question, we conducted a qualitative study to understand the viewpoints of students from a four-year urban, minority-serving institution in the Western United States. We draw upon the capital theory as the sensitizing theoretical lens, as it premises that various forms of capital are enablers in career decisions (Bourdieu, 1986) and it has been adopted in the IS literature (e.g., Joshi et al. 2016).

## Theoretical Background

First-generation college students (FGS) are students who are enrolled in postsecondary education and whose parents do not have any postsecondary education experience (Redford and Hoyer, 2017). By contrast, the continuing-generation college students (CGS) are students who enrolled in postsecondary education who have at least one parent with some postsecondary experience. The comparison of FGS with their peers is striking, especially in terms of their household income and college success. Redford and Hoyer (2017) found that among high school sophomore cohort that later entered college, 27% of FGS would come from low income households (household income \$20,000 or less), while only 6% of CGS did. Ten years later, only 20% of the FGS obtained a bachelor's degree, compared to 42% of CGS.

Prior research has identified socioeconomic status (SES) and individual background variables as the dominant barriers to college success. For example, Nunez and Cuccaro-Alamin (1998) identified poor academic preparation, family responsibilities, and full-time work as key barriers that obstructed the realization of FGS's college goals. Lohfink and Paulsen (2005) indicated that three background variables—being Hispanic, low-income, and female—were negatively associated with FGS' persistence from first year to second year in college. In addition, social support from family and peers has been frequently cited by FGS as key factors contributing to students' academic success. The literature outlined above hints at how various forms of capital (social, economic status, cultural) are conducive to the success of FGS.

In this qualitative study, we employed the capital theory by Bourdieu (1986) as a sensitizing framework for understanding the career-related decision making of first-generation students who are members of under-represented groups. According to Bourdieu (1986, 2002), capital can present itself in four fundamental forms: economic, cultural, social, and technical. *Economic capital* refers to monetary resources and can be expressed as money or property. *Cultural capital* includes shared, cultural signals such as attitudes, preferences, and behaviors, as well as educational qualifications. *Social capital* is comprised of social obligations or connections, and encompasses individual's socio-economic status, social networks, and the social status/standing of their connections. *Technical capital* captures the technology-related skills that a person develops using computing equipment. Bourdieu's capital theory has only recently begun to appear in the IS literature. For example, Joshi et al. (2016) found that African American men succeed in IT careers by accumulating several forms of capital—Cultural, Social, Symbolic, Technical, and Economic.

## Research Method

To address our research question, we conducted a qualitative study. The research site is an urban, public minority serving university in the western United States. This university had a total enrollment of just under 15,000 students, with 37 percent male students and 63 percent female students, and more than 100,000 alumni worldwide. According to the latest data, sixty-one percent of the student population identify themselves as first-generation college students. According to the *US News and World Report*, this university is one of the most ethnically and economically diverse universities in the western United States. Given the diversity of the student population and the high percentage of FGS, this university has become an ideal site for us to study the career choice behaviors of first-generation college students.

The data was collected via online survey containing both open-ended questions and structured questions. Data was collected from 112 students across five classes via Survey Monkey in May 2019. The five classes included two general education classes open to the entire campus, two computer information systems major classes from School of Business, and one computer science class from College of Engineering.

We asked the students to identify themselves as “first-generation students” or not, and why they decided on their current major. We asked them to describe who and/or what motivated them to pursue a college education, and why they have (or have not) thought about pursuing a career in IT. We have completed a preliminary analysis of 20 participants' responses and report the initial findings here.

Among the 20 participants, 11 (55%) are first-generation students, 13 (65%) are male students, and 13 (65%) are employed full-time or part-time. The participants' age ranged from 17 to 49 years, with a mean age of 25 (std 7.2) and median age of 23.5. The characteristics of the sample are summarized in Table 1. Each cell represents the % for the demographic factor (ethnicity) or choice of IT major.

	Asian or Pacific Islander	Black or African American	Hispanic or Latino	White / Caucasian	IT Major	Non-IT Major	Total
FGS	9.1%	9.1%	72.7%	9.1%	27.3%	72.7%	100%
Non-FGS	66.7%	11.1%	0.0%	22.2%	88.9%	11.1%	100%
Total	35.0%	10.0%	40.0%	15.0%	55.0%	45.0%	100%

**Table 1. Sample Characteristics (n=20)**

As shown in Table 1, Hispanic or Latino students account for the majority (72.7%) of first-generation students, but only a small percentage (27.3%) of the first-generation students chose IT major, compared to 88.9% of non-first-generation students. The numbers in Table 1 are the percentages of the row total.

Two authors coded the respondents' narratives on the factors that influenced their decisions regarding college major, by starting with the categories of capital proposed by Bourdieu (1986; 2002) and applied in Joshi et al. (2016). Each coder applied the coding scheme independently. The unit of analysis was the sentence. The two coders then compared their results and discussed the coding to reach agreement. Themes that emerged were discussed and compared with the existing coding scheme, and revisions to the coding scheme were made accordingly.

## Preliminary Finding

Our data analysis revealed four major influencing factors—social capital, technical capital, perceived job opportunities, and interests -- in students' career choice behaviors. Table 2 below shows the difference between FGS and CGS in terms of the four factors identified in their choice of IT vs. non-IT majors.

	Interest	Perceived Job Opportunity	Social Capital	Technical Capital	Total
<b>FGS</b>	27.3%	36.4%	18.2%	18.2%	100%
IT-Major	33.3%	33.3%	0.0%	33.3%	100%
Not IT-Major	25.0%	37.5%	25.0%	12.5%	100%
<b>CGS</b>	33.3%	22.2%	33.3%	11.1%	100%
IT-Major	25.0%	25.0%	37.5%	12.5%	100%
Not IT-Major	100.0%	0.0%	0.0%	0.0%	100%
<b>Total</b>	<b>30.0%</b>	<b>30.0%</b>	<b>25.0%</b>	<b>15.0%</b>	<b>100%</b>

**Table 2. Frequency Distribution of the Four Factors between FGS and CGS (n=20)**

As reflected in Table 2, FGS' choice of IT major is influenced equally by three factors (interest, perceived job opportunity, and technical capital), except social capital. This is not surprising: being the family to attend college, FGS often lack exposure to social relations (family, friends, community) associated with IT profession. However, among those continuing generation students, 37.5% of them showed social capital as the factor motivating their IT-major choice. Each of the factors is presented and elaborated below.

## Social Capital

As noted previously and consistent with prior studies (e.g., Joshi et al, 2016), social capital refers to having access to relationships with others knowledgeable about the field of study (i.e., IT, Accounting). Participants made statements such as:

“Parents pressure to change my major [to computer science]” (*Asian male, 23 years old; graduate student in computer science; employed part-time*).

## **Technical Capital**

Consistent with prior studies (e.g., Joshi et al, 2016) technical capital refers to exposure, previous experience with familiarity with the computing aspects in the field of study (e.g., IT, Accounting) and the related credentials. Participants made statements such as:

“At some point I had but I took a few courses (in computer and IT) and realized it’s not for me. I am currently a purchasing coordinator and I wanted to select something to complement my current position.” (*Hispanic female, 28 years old; Business major; employed full-time*).

## **Interests**

This factor emerged from the participants and focuses on individual perceptions of interest in and passion for the chosen field of study. Participants made statements such as:

“I was always interested in computers and liked the fact that this Computer Information Systems touched on various topics surrounding computers.” (*African American female; 25 years old; senior student in CIS systems; not employed, student only*)

## **Perceived Job Opportunities**

This factor emerged from the participants and refers to the perceived job opportunities and job security expected from the chosen field (e.g., IT, accounting). Participants made statements such as:

“The growing demand of programmers helped lead the way. I also like solving problems. Yes, it is the future. More and more stuff is getting automated and there is a need for people to program the technology.” (*Caucasian male, 31 years old; graduate student in computer science; employed full-time*),

## **Discussion**

This study found four factors that influence college students’ IT career choice behavior. Two of the factors—social capital and technical capital—are consistent with the Capital Theory, and two factors—interests and perceived job opportunities—emerged from the data.

Our preliminary data analysis has indicated that social capital could play a role in influencing the choice behaviors of the minority FGS regarding college IT major. It is difficult to make inferences on the limited dataset, but it appears that parents may play a particularly important role in major selection. Research has shown the importance of building a support for FGS from the higher education institutions and college network of advisors, counselors and faculty to provide the minority FGS exposure and opportunities to pursue computer degrees at college (Giannakos et al., 2017). The supportive environment includes the networks of student services for academic and non-academic needs (e.g., work and family) and social interactions, such as relationship with faculty, other students, and administrative offices.

Our study also indicates the role of technical capital in influencing the minority students’ career choice behaviors. This finding is consistent with the prior studies of African American students (i.e., Joshi et al, 2016). However, our study reveals a variety of sources for cultivating the technical knowledge and familiarity—IT-oriented programs on campus, resources from employment, and online resources—thus potentially extending the scope of technical capital.

The interests theme emerged from the participants in this study. Participants addressed their individual perceptions of computing, interest in computing, and passion for the chosen field of study. Several participants used emotion-laden terms such as “fascinated”, “huge interest”, “always interested” when referring to their computing-related major choice.

The perceived job opportunities theme also emerged from the participants. Both the students currently in the workplace, and those not yet working in a professional capacity expressed perceptions of job security/high demand within the computing field.

Surprisingly, the economic and culture capital dimensions did not emerge as influencing FGS IT career choices. One possible explanation for the absence of the two dimensions is the small size of the dataset for the ERF. In addition, the coding for economic capital and cultural capital would need to be refined.

## Concluding Remarks and Next Steps

This study has the potential to contribute to the literature on social inclusion by developing and testing IT specific theory regarding factors that influence FGS college students' career choice behavior toward computing. When we view this study through the lens of social inclusion, we see a glimpse of the factors that may be further explored so that we can address the "underutilization of our nation's human capital" and address "concerns of equity in the U.S. educational and employment systems" (Ong et al., 2011, p.172).

This work-in-progress paper is based on the initial findings from a preliminary analysis of 20 participants' responses. In addition, Social Cognitive Career Theory (i.e., Lent et al., 2000) may inform our coding scheme and allow us to identify additional factors. Ultimately, our goal is to expand the diversity and inclusiveness of the IT professional workforce.

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