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Toward Recruitment and Retention Strategies Based on the Early Exposure to the IT Occupational Culture

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ABSTRACT

In this research in progress, we examine cultural issues of the occupation that generate negative attitudes toward IT majors. This project follows a qualitative and quantitative study whose findings suggest that culture of the IT occupation plays a critical role in a student's decision to pursue or continue in the IT occupation – especially for women and minorities. We propose that inoculation theory provides an ideal framework to enhance students' recruitment and retention in IT majors. Exposing students to small doses of the negative aspects of the IT profession that we found in our previous study will affect their decisions. We video-taped interviews of senior IT students to extract video segments that would impact students who have not had work experience in the IT field yet. These segments will be part of a workshop where the videos will be presented. In this report we present the theoretical framework that explains our approach and the procedure that we are following.

Keywords

Recruitment, Occupational Culture of IS/IT personnel, Occupational Commitment, IT Workforce.

INTRODUCTION

“Culture matters because decisions made without awareness of the operative cultural forces may have unanticipated and undesirable consequences” (Schein, 1999).

Numerous studies conducted in higher education and other education levels have documented the general lack of interest and more specifically the under-representation of women and minorities in the Science, Technology, Engineering, and Math (STEM) disciplines, especially in the information technology (IT) workforce in the United States. These concerns and the high interest to find solutions to this phenomenon are clearly reflected on the amounts of financial support for research in this area. The U.S is one of the leading countries in this regard and has established several research projects and planning programs at all levels to undertake recruitment and retention in general but especially the retention and recruitment of minority groups that are under represented in STEM disciplines. The Information Technology Workforce Project is one of the National Science Foundation programs that funds many research endeavors across a variety of scientific and social disciplines at US colleges and universities¹ and has funded the following research project on IT retention. In this study we present a cultural approach aimed to address recruitment and retention issues in the IT field based on the cultural characteristics of IT occupations and propositions of inoculation.

Some studies that addressed this lack of interest in IT have looked at it from a gender perspective. Those studies have presented conflicting results regarding the attitudes toward technology by gender. For example, Bain and Rice (2006) found that those attitudes towards technology differ significantly between males and females. In addition, other studies reported negative female attitudes towards computers and the Internet (i.e. Schumacher, P., & Morahan-Martin, 2001). Teasdale & Lupart (2001) and Young (2000) suggest that females tend to have more negative attitudes towards computers than males. On the other hand, other studies indicate that there are no gender differences in attitudes toward computers (Nelson and Cooper, 1997; Fan and Macrediel, 2006). These conflicting findings in the literature suggest that there are other factors that have not been considered while studying the negative attitudes toward IT. In this research project, we examine cultural issues of the occupation that generate negative attitudes toward IT majors that affect recruitment and retention in IT.

The cultural approach in studying conflicting situations within social groups of people has been articulated by many researchers (i.e. Martin, 1992, Schein, 1999; Trice & Beyer, 1984; Wilkins & Dyer, 1988) In a recent study, Leidner and Kayworth (2006) presented a review of 82 research studies of the organizational and cross-cultural IT literature that

¹ http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf03609

conceptually links culture with IT. They developed six themes of IT-culture research emphasizing culture's impact on IT, IT's impact on culture and IT culture. The authors conclude that culture in general is a critical variable in explaining how social groups interact with IT and that there is a gap in the literature in defining the values, attitudes and enculturation in IT (Leidner and Kayworth, 2006).

Recent studies of the IT occupational culture have identified a set of features that characterize the culture of IT occupations (Guzman et al., 2004; Gerulat, 2003; Ramachandran & Rao, 2006). Guzman et al. (2005) carried out a qualitative study where they found that people became aware of the cultural features of the occupation only when they obtain work experience in the field. A subsequent quantitative research study conducted in the United States concluded that adaptation (or enculturation) to the IT occupational culture influences commitment to the profession and that there are different attitudes towards those cultural features by gender and ethnicity within college students that have work experience in IT (Guzman, 2006). In this study we want to evaluate the impact of an early exposure to those cultural characteristics of the occupation on recruitment and retention of IT college students with no work experience in the field.

In summary, this exploratory study is looking the answer the following question:

RQ: What is the impact of an early exposure of the cultural characteristics of IT occupations on recruitment and retention in IT majors?

In order to accomplish our objectives, we first present a summary of the findings about IT occupational culture, literature review of inoculation theory and recently collected qualitative data in order to formulate our propositions.

LITERATURE REVIEW

IT Occupational Culture

Culture can be defined as the shared philosophies, ideologies, values, assumptions, beliefs, expectations, attitudes, and norms that people have in common with others in a community (Hall, 1959, 1976; Hofstede, 1997; Trice, 1993). Trice (1993) identified occupational subcultures within organizations referring to unique clusters of ideologies, beliefs, cultural forms, and practices of individuals who are part of an occupation. These values arise from the shared educational, personal, and work experiences within the occupation. Organizations have therefore many subgroups that based on their occupations develop their own occupational subcultures. Occupational culture is one among several social influences that affects the education, adjustment, and retention of member of occupations.

Previous studies about the occupational cultures in IT have identified a set of features that characterize the culture of IT occupations (Guzman et al., 2004; Gerulat, 2003; Ramachandran & Rao, 2006). By applying Trice's (1993) work, it was found, for example, that the IT occupational culture is characterized by high appreciation of knowledge, extreme and unusual time, demands on people in the profession, feelings of superiority relative to IT users, a typical lack of formal work rules in the IT occupational setting, regular use of IT in the leisure time, and finally, use of technical jargon and existing stereotypes as cultural forms recognized in the society. [ref]

Using sequential mixed methodology: qualitative first (nine focus groups and 25 interviews) and then quantitative (survey, n=215), Guzman and Stanton (Guzman et al, 2005; Guzman, 2006, Stanton, Guzman and Fagnot, 2006) studied the IT occupational culture and developed a survey instrument to measure the perceptions towards each of the IT occupational culture features and its influence on occupational commitment. The main finding of the quantitative phase was that the adaptation to the IT occupational subculture features is good predictor of occupational commitment, more significantly to affective occupational commitment. Furthermore, the statistical analysis of the survey indicated the following:

- Males reported higher self-efficacy concerning the demands of the occupation than females Males also indicated that they integrated IT into their leisure activities more extensively than females.
- In terms of the adaptation to the occupational culture, new information technologists in the United States showed that those with better adaptation to the IT occupational culture felt higher emotional attachment (affective commitment) to their occupation.
- Enjoyment of learning and keeping up with technology and integration of IT in leisure activities are good predictors of affective commitment.
- Those who tend to accept the stereotypes of the IT occupations (geek/nerd) feel lower affective commitment. That is, those who show better affective commitment are most likely to reject or ignore the stereotypes.

- Information technologists who felt higher degree of enjoyment about the challenges of the occupation felt a higher obligation to remain in it (normative commitment).

An important finding of the qualitative phase later confirmed in the quantitative phase is that there is a notable difference between the knowledge and perceptions about the IT occupation between students who had some work experience versus the ones who never worked in the IT field. Students with no work experience were not able to tell us about norms, values and cultural forms of the occupation because they were not familiar with them. For example, they could not talk about their interaction with users or other IT people in the field, they could not tell us about the regular challenges of the occupation such as how they keep up to date with the technology, since most of what they see about technology is what it is required to pass their classes. This is why the present study focuses on students who did not have any work experience in order to simulate the exposure to the IT occupational culture and then evaluate their willingness to pursue IT majors. We hypothesize that certain features of the occupational subculture of IT may influence students' persistence and that these same features may have differential effects depending on gender and ethnicity. The theoretical framework that guides this approach is the inoculation theory.

Inoculation Theory

The inoculation approach of McGuire (1964) is designed to bolster existing attitudes against change (Miller & Burgoon, 1973). Inoculation theory is one of resistance to persuasion (Goldbold, 1998). McGuire (1970) argued that a message can inoculate an individual against subsequent attacks to his or her attitude by providing a weakened form of that attack and then refuting it. There are two components of an inoculative message that allow individuals to build up resistance. First, there must be a threat to one's attitude – the refutation then provides the ammunition against the attack to the attitude. Second, the threat is the receiver's acknowledgement of the vulnerability of attitudes to subsequent influence. The threat component causes individuals to be motivated to shore up an attitude through counterarguing.

According to Pfau, Kenski, & Sorenson (1990) the following steps comprise an effective inoculation procedure: Warn the listener of the impending attack, make a weak attack, and have the listener actively articulate defenses against the attack. More details on these points appears below (Guzman and Stanton, 2004):

- *Warn of the attack:* Warning initiates the inoculation process and helps to activate defenses. After hearing the warning, listeners may feel somewhat threatened, and this is a key component of the inoculation process. In our intervention situation, we will warn students that we are about to describe negative aspects of IT occupational subculture, not in an attempt to dissuade them from pursuing the IT major or career, but as a method of preparation for work circumstances that may differ from their ideals. When students receive the warning they will begin to generate possible defenses against the coming attack.
- *Make a weak attack:* The attack comprises persuasion toward a view, belief, or attitude that is alien to the individuals existing beliefs and attitudes. The intervention will attempt to change the thoughts, feelings, and behaviors of the students about their preferred ideals for occupational cultural conditions. The attack must be strong enough to force the listeners to defend but not so strong as to overcome the defense. In our intervention, we will weakly try to dissuade students from their current occupational ideals by accurately portraying some of the negative characteristics of IT occupational subculture derived from our own and others' research.
- *Make the listener actively defend:* Psychological research on attitude change has shown that the more actively the listener defends against the attack, the stronger their future resistance to change will be. It is therefore important to get the listeners to express as many and varied defense strategies as possible. We will employ and support discussion component to this phase of the inoculation so that intervention participants can share and evaluate strategies for resisting the negative occupational culture experiences to which they may be exposed during formative IT work experiences.

Inoculation techniques have been successfully applied to a variety of application domains including marketing, advertising, political campaigning, and education. For example, inoculation has been shown to be effective in inducing resistance to alcohol use (Goldbold and Pfau 2000) and negative comparative advertising (Kamins and Asseal 1987; Pfau 1992). Goldbold and Pfau (2000) conducted a study with 417 sixth graders who were nondrinkers and participated in a test of inoculation theory. Students viewed either a normative or information-based antidrinking public service announcement (PSA) or a neutral PSA unrelated to alcohol (Goldbold & Pfau, 2000) although the students rated the PSAs as less enjoyable and appealing, the spots were perceived as more realistic, honest, and effective than TV commercials. The students who had received the inoculative messages were more resistant to the attack, providing support for the inoculation paradigm (Goldbold, 1998).

Analogously, it would be important to prepare potential members of the IT occupation for the “cultural attacks” that they may undergo so they can be prepared, resist and positively influence IT occupational subculture in future educational and employment endeavors. A weak persuasive attack activates defensive mechanisms supporting the belief that is attacked. These activated mechanisms help warding off a subsequent strong attack on the belief. By overcoming the “weak attack” of the inoculation, stronger attacks can be resisted later on (Burgoon, Cohen, & Miller, 1978). It is important, however, that the initial attack does not overwhelm the defensive mechanisms. Otherwise, the belief you wanted to strengthen will get weaker and possibly even shift in the opposite direction.

Psychological research suggests that inoculation works by encouraging listeners to systematically analyze and reinforce the importance of their own beliefs with respect to the conflicting beliefs presented to them (Benoit, 1991; Duryea, 1982; Etgar & Goodwin, 1982; Godbold, 1998; Godbold & Pfau, 2000; Goldstein, 1982; Kennedy, 1982; Lum, 1997; Szybillo & Heslin, 1973). The more they think, the stronger their defense against future persuasive experience becomes. When individuals evaluate and assess their own beliefs and attitudes, and then defend these against anticipated adverse experiences, this process strengthens their own attitudes, beliefs, and behaviors. We therefore suggest that students who receive inoculative messages about the IT occupational culture will be more resistant to the actual attack IT occupations.

We thus propose,

A greater exposure to IT occupational features will result in a more positive attitude towards pursuing IT majors.

RESEARCH OVERVIEW

Participants and Procedures

To expose students to IT occupational features, we are developing persuasive attacks that will activate students’ defensive mechanisms related to the IT occupational culture. The development of these persuasive attacks encompasses three phases: 1) Video-interviews of IT students, 2) Identification of potential video segments, and 3) Pilot testing of these segments in focus groups with students from all majors. The first phase is completed; the second is currently taking place and the third one will occur in the next few weeks.

During the interviews, IT students were asked to share their experiences in IT classes, internship and work experiences in the IT fields. The participants were questioned on the challenges they faced and their reasons for choosing an IT major. The interviews were video-taped. Segments of these videos will be shown to the focus groups participants.

The video interviews are presently being reviewed by two researchers – subject matter experts who have been working in the project in the last three years and have research training in Information Science and Technology, and Education. The researchers are in the process of selecting segments illustrative of the findings of our previous research. The segments are edited with the video editing software: Adobe Premiere Elements. They are approximately one minute-long. All the segments are presented weekly to a research team composed of six graduate students in the IT field and education. Their relevance is discussed at each research meeting.

The next phase consists of pilot testing these segments with undergraduate students in focus groups that will be composed of at least five students. During the focus groups, students will first watch the segments, discuss their relevance, and express their opinions on the topic. The segments that will be incorporated in the workshop will be selected based. Once we have identified the best messages – based upon their effectiveness at generating discussion – to be used as attacks, we will develop workshops targeted towards undergraduate students who have not been exposed to the IT occupational culture yet. In other words, our participants will be students without work experience in IT.

Below are sample inoculative messages. The first message illustrates the fact that pervasiveness in the IT occupation translates into IT invading a person’s life; that this person’s friends are in IT, and that in their free time they are working on IT. In other words, occupation meshes with non-occupational life.

Interviewer: Would you say that people that are your friends look at you and think that you are the IT guy?

Student: It’s happened. Sure. I think I get more IT work sometimes outside of work than I get at inside of work. And I spend eight hours here! So, I think that there’s always the friends you have who will always be calling you and say “Oops, I did something to my computer! How do I make this work? Or I would really like to create a video,

I would really like to create digital imaging, something like that.” And just don’t know how to do it and the perception is always that the IT guy knows everything. Of course! Somewhere along the line, we must have as IT people learn all there is to know about computers. But at the same time I think that everybody in this field loves to learn what they don’t know about computers and we have enough of a familiarity of how things work to kind of roll our sleeves, dive in and actually look like we know what we’re doing!

The following inoculative message presents the point of view of a student on the stereotype “geek/nerd.” Our previous study showed that those who ignore the stereotype show more affective commitment to the IT profession.

Interviewer: Have you ever been called by friends or others a geek or a nerd?

Student: Yes, I have. But you know I have no issue with that, because when their computer needs to be fixed I’m the first one to call. So, you know, you gotta take it with a shred. So, it really doesn’t bother me. If I am to be called a geek or a nerd, then I guess that’s what I am. But as long as I make one happy with what I am doing, it doesn’t make a difference. A label doesn’t bother me.

Interviewer: How do you see geek or nerd?

Student: I see no negative connotation in it. I mean there could be negative connotations in the term geek or nerd, but it just means someone who’s focused on what they’re doing and knows a lot about a general subject. Sometimes maybe they put too much emphasis into that one topic but it’s really what a person decides to do with their life.

Affective commitment to the IT field can also be found in IT students or professionals that embrace being life-long learners and enjoy keeping up with the latest trends in IT. The inoculative message below is an illustration of this finding:

Interviewer: Do you see keeping up with technology as a challenge? I mean perhaps in your internship you were in the learning phase but do you feel when you get a job that it’s going to be a challenge to keep up with you know all the latest?

Student: I think so. I definitely think so because technology is constantly changing. And so you always have to keep on learning. You really have to be a life-long learner when it comes to technology because it’s constantly changing – new things are evolving, and you need to always be aware especially if you expect to be in a high level as in a manager or if you want to be a CIO you just always have to learn so I do think so.

Interviewer: And how do you keep up on all of this?

Student: I’m just always reading. I love to read. I read the magazines. Even if it is to just go on the Internet, I find out what’s out there, what’s new. You know, just learning about that.

As mentioned before, IT professionals who present a higher normative commitment to the field are those that enjoy overcoming the challenges found in the IT field as demonstrated in the subsequent message:

Interviewer: Were you ever overwhelmed by IT?

Student: Actually there are times as a college student you have a whole bunch of projects, but overwhelmed, no, because I enjoy it, I like it. I like when I am given projects and you have to come up with a business plan and different type of stuff and have to try to organize it well like my database management course. It was a challenge just because I had to deal with SQL and that’s coding. And, I don’t have the patience for that sometimes, but at the end, the end-result, my project that I did, my database project, I loved it. I was in love. I didn’t know I was capable of creating a report that way and I just love all the projects that they give us so I’ve been there but I never felt overwhelmed at all. Actually, I enjoyed it!

DISCUSSION

This study will identify video segments on IT students’ experiences at the workplace or in classes that will be effective at generating discussion during workshops intending to improve retention in IT majors. These inoculative messages will be presented to students that have not yet had a work experience in the IT field. These segments will familiarize them with challenging situations that they might face in their professional life. As aforementioned on the principles of inoculation theory, a weak attack presented to students will threaten them and compel them to think more thoroughly and acutely about the subculture of the IT field. The more they think, the stronger their defense against future persuasive experience becomes.

The next step in this research may include broadening our sample to the whole IT community instead of focusing essentially on women and minorities. This would enable us to test whether our findings apply a larger group or not. These results may in turn allow us to assess the disparity of effects on gender and ethnicity.

CONCLUSION

In overview, we conducted video interviews of students in IT majors who were recently or currently involved in some type of pre-professional work activity such as an internship. We collected their experiences at the workplace to select among them segments that would be representative of the challenges typical of the IT occupation culture. The video segments selected from this study will be the core of the workshop we are developing whose goal is to enhance the recruitment and retention of students – principally women and minorities – in IT majors.

A powerful intervention such as this workshop will provide, essentially women and minority students, the social and psychological tools to avoid losing their vocational beliefs and preferences, even in the face of workplace occupational cultures that would normally conflict with them. By preparing women and minority IT students for the “cultural attacks” that they may undergo in their formative work experiences, we believe that we can prepare them to resist and positively influence IT occupational subculture in future educational and employment endeavors.

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