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ABSTRACT

According to Trice (1993), occupational subcultures comprise unique clusters of ideologies, beliefs, cultural forms, and practices that arise from shared educational, personal and work experiences of individuals who pursue the same profession. Results of the analysis of the IT workforce suggest that IT professionals indeed occupy a recognizable "occupational subculture" that crosses and transcends the particular organizational culture in which those IT professionals are embedded (Guzman et.al., 2004). Our study looks at the students' first IT job experiences in order to track cultural expectations and impressions over time. In addition, this study attempts to confirm a model of occupational culture "socialization" (Elkin, 1960) in a cross sectional study of IT students. Finally, this study will test an inoculation program based on our model that may help to protect higher education students from "culture shock" as they undertake their initial paraprofessional IT work experiences. The goal of our study is to contribute to a better understanding of the occupational subculture of the IT profession and the academic strategies to minimize mismatch between cultural expectations and impressions of IT students.

Keywords

IT professionals, IT Workforce, information systems personnel, Occupational Subculture, socialization, Inoculation Theory, Focus Groups.

INTRODUCTION

The trade and academic literature on Information Technology (IT) clearly suggest that conflict exists between IT professionals and other groups of employees (Igbaria and Shayo, 2004). Similarly, other studies report higher job stress and burnout among them. Researchers have noted that end users and IT professionals have different styles for diplomacy, directing, assertiveness, and nonverbal communication (e.g., Alvarez, 2002), while others have uncovered conflicts related to technical rules, norms, and regulations (e.g., Franz & Robey, 1986). Together, these findings suggest that interpersonal communication failures occur not necessarily as a result of a lack of skills on the part of IT professionals, but because of different normative communication strategies among groups in the organization. These communication strategies, in turn, may arise from or obtain substantial influence from the cultural origins of the individual (e.g., Hall, 1959, 1976). Failures of communication between subcultural groups frequently provide the touch point for subsequent failures to cooperate or coordinate the actions of these groups. More importantly, communication failures contribute to the cultural conditions of IT work that some individuals find unattractive, such as the extensive use of jargon and acronyms. Results of the analysis of the IT workforce suggest that IT professionals indeed occupy a recognizable "occupational subculture" that crosses and transcends the particular organizational culture in which those IT professionals are embedded (Guzman et.al., 2004). However, there is no empirical evidence about the initial approaches to the occupational subculture of IT professionals. We seek to illustrate how data and analyses of the expectations and perceptions of cultural conditions that IT students encounter in their formative work experiences may provide insights into intervention techniques to address these cultural conditions, what we call "culture clash".

SUMMARY OF LITERATURE

Many researchers, such as Orlikowski and Baroudi (1989), Myers (1991), and Kling (2003) have articulated the importance of studying the culture and context of IT professional employment. Other studies looked at the IT employment in juxtaposition with other occupational and organizational groups such as managers, users, and IT professionals within an interconnected network of social actors (Stanton & Stam, 2003; Lamb & Kling, 2003), where both the "glue" holding groups together and the "boundaries" between groups are phenomena that contribute to the nature and experience of the IT professions. These studies suggest that trouble with either the "glue" holding groups together and/or the "boundaries"

between groups augments the problems that organizations encounter in deploying IT and obtaining productivity benefits from it. According to Kling, these problems could plausibly be diminished with a, "critical understanding of the relationships between… socio-technical interventions, social behavior of other participants (non-IT professionals) in different roles, and the dynamics of organizational and social change" (Kling, 2003, p. 395). The present study suggests that the occupational "atmosphere" and the subculture of the IT professional are a joint product of the social dynamics that occur between IT professionals, managers, and end users in typical organizations.

These social dynamics are inextricably embedded within the subcultural contexts in which they occur. Here, we make an important distinction between organizational culture and occupational subculture, as well as between organizational culture and national or ethnic cultures. Organizational culture is defined as a "pattern of shared basic assumptions that the group learned as it solved its problems of external adaptations and internal integrations, that has worked well enough to be considered valid and, therefore to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (Schein, 1992, p.12). Organizational cultures depend upon the history and mission of the particular organization and vary substantially on a number of dimensions across organizations. Cultures are usually dynamic: New members gradually add new behaviors and ideologies to those that the group already possesses. Some cultures may accept such changes easily while others react with varying levels of resistance.

OCCUPATIONAL SUBCULTURES

In contrast to organizational culture, which to some degree influences all individuals in an organization with its overarching ideologies and modes of behavior arising from both mission and history, occupational culture arises from the shared educational, personal, and work experiences of individuals who pursue the same profession (Trice, 1993). As groups of individuals from a particular occupation work towards the organization's common goal, their distinct ideologies accentuate the behavior that works best within the context of their particular occupation. Thus, one may say that multiple subcultures exist within the overall organizational culture and that some of these subcultures are defined by a group's occupational identity.

According to Trice (1993), each occupational subculture comprises a unique cluster of ideologies, beliefs, cultural forms, and practices. Because the nature of each subculture is often based on the specific occupational roles of its members, subcultural boundaries exist that define insiders and outsiders. Successful "translation" across subcultural boundaries can facilitate better communication among organizational members, while disparities in ideologies and practices among different organizational subcultures may cause friction as members of these subcultures interact to accomplish organizational missions. This latter point is crucial to the current study, because one of the goals of our intervention strategy lies in preparing IT students to effectively become "bicultural:" That is, to retain the positive beliefs and expectations they hold about the nature of jobs and work while becoming translators and ambassadors into the IT occupational subculture.

The Occupational Subculture of IT Professionals

Guzman, Stanton, Stam, Vijayasri, Yamoro, Zakaria and Caldera (2004) explored the intra-organizational social dynamics driven by the introduction of new forms of information technology in work organizations. The authors provide an analysis of the social milieu of IT professionals from a variety of different work environments: the communication patterns, language, symbols, preferred modes of interactions, and relations with other individuals and groups in the organization. Results of this analysis, suggest that IT professionals indeed occupy a distinct and recognizable "occupational subculture" that crosses and transcends the particular organizational culture in which those IT professionals are embedded (Guzman, et al., 2004). Further, it is suggested that characteristics of this occupational subculture put its members at odds with other groups in the organization such as managers and IT end users.

In their study, Guzman et.al. (2004) conducted an in depth interview study of 32 IT professionals, 82 end users, and 7 executive managers who were employed in a variety of organizational contexts in order to assess the extent to which these individuals descriptions of the IT social milieu fit with Trice's signs and symbols of occupational subculture. Consistent with Trice's framework, IT professionals provided evidence consistent with the existence of a distinct occupational subculture possessing the following characteristics:

- Frequent use of unique technical knowledge, jargon, and vocabulary as a means of establishing group identity, maintaining boundaries between groups, and excluding out-group members

- Extreme and unusual demands pertaining to working in the profession, particularly relating to long hours, angry users, and the need for constant self re-education as a form of intra-group bonding

- Complaints about the behaviors and abilities of end-users and about being misunderstood by managers as a form of intra-group bonding

- A shared sense of satisfaction about helping others with technology that supports and justifies the importance of the occupation

- Professional ethnocentrism including feelings of superiority and control over other groups and their members

- Physical settings involving electronic equipment and disorder as signals of group membership

- Unique and shared stories about the history of information technology as a means of identifying members, validating membership and as a form of intra-group bonding

- Weak grid dimension characterized by lack of formal work rules and absence of clear requirements for membership

Intercultural dysfunction was also caused by adverse stereotypes that IT professionals had of end users and vice versa. Discrepancies arose with respect to the level of personalized support that was expected from IT professionals by end users.

In summary, Guzman et.al. (2004) obtained evidence that IT professionals as a group exhibit many of the characteristics of an occupational subculture, that other organizational members recognize that characteristic identity, that conflict and dysfunction may accompany interaction between the IT occupational subculture and other groups, and that restorative adaptations are possible when individuals from one group adopt and adapt another group's cultural forms, however temporarily. This analysis of the characteristics of the occupational subculture of IT professionals may provide substantial insights into the effects that formative work experiences have on IT students. We hypothesize that based on prior educational and family-based socialization that students hold different sets of expectations with respect to the ideal cultural characteristics of a desirable workplace.

As some of these results suggest, conflicts and dysfunction exist between members of the IT professional subculture and other organizational members as they communicate and interact with one another. These dysfunctions accord with Trice's predictions with respect to relations between occupational subcultures. To overcome such dysfunctions, members of subcultures can learn to accommodate and coexist with one another. Trice (1993) suggested that two mechanisms, accommodation and assimilation, make these changes possible. Intercultural adaptations involve a level of cooperation and acceptance that occurs when an individual becomes acclimatized to behaving more in the mode of an individual from another subculture. The most successful and effective IT professionals encountered in Guzman's research (2004) exhibited this capability of acclimatizing themselves both to the values and proclivities of the end user community and the managerial community. Frequently, however, it was also found that many IT professionals expected members of other groups to learn about the IT perspective or orientation to a problem.

SOCIALIZATION TO THE OCCUPATIONAL SUBCULTURE

Formative work experiences can play a powerful role in changing vocational beliefs and preferences by providing work experiences that students believe to be representative of their later employment prospects. Students may in fact overgeneralize both positive and negative events and evidence from these formative experiences (Neuman, 1999; Cantor, 1995; Jackson 1998, Mariani 1997; Sovilla, 1998). Reskin and Roos (1991) state that disparate retention of IT students into a profession results partly from formative work experiences. Their work also suggests that women, as a whole, value different aspects of previously male-dominated professions than men (e.g., higher value on congenial working conditions, community of coworkers, etc.). McLean, Smits, and Tanner (1991) concluded that the first few months of employment are critical to the development of commitment. Guest (2001) reported that initial perceptions of the job influence graduates' decisions to stay or leave their first employer determining their future job application intentions.

Elkin (1960) as cited King and Sethi (1998), defines socialization as the process by which someone learns the ways of a given society or social group so that he can function within it. Thus, the process of socialization of IT students to the IT profession is the first approach to the occupational subculture of IT professionals. Strong disconfirmations of expectations tend to have a powerful psychological effect on decision-making and can cause attitudes and beliefs to shift abruptly. We hypothesize IT students possess expectations about the nature of preferred occupational subculture that differ substantially from the reality of most contemporary IT workplaces. We hypothesize that the occupational subculture of IT professionals conflicts with the vocational expectations of IT students who decide to change the profession.

From the academic perspective, we believe that a powerful intervention could result from giving IT 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. The strategy we draw upon is one that is well developed in the

psychological literature as a method of resisting attitude change, namely inoculation theory (Pfau & Burgoon, 1986; Pfau, Kenski, & Sorenson, 1990).

Inoculation method

The term, "Inoculation Theory," is drawn from the public health practice of giving shots to prevent diseases. The analogy suggests that just as inoculation activates the body's immune system defenses in a constructive and beneficial way, psychological inoculation activates mental defenses in a constructive and beneficial way. By overcoming the "weak attack" of the inoculation, stronger attacks can be resisted later on (Burgoon, Cohen, & Miller, 1978). Analogously, by preparing 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. If we want to strengthen existing positive attitudes, beliefs, and behaviors, related to occupational subculture inoculation theory suggests that we should present a weak attack on those attitudes, beliefs, and behaviors. If the attack is too strong, it will cause the attitude, belief, or behavior to get weaker or even move to the opposite position. The attack has to be strong enough to challenge the defenses of the listener without overwhelming them.

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 detail on these points appears below:

- 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 the 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.

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 (Burgoon, Cohen, & Miller, 1978). The weak attack threatens the listeners and forces them to think more carefully, deeply, and effortfully. 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. Inoculation techniques have been successfully applied to a variety of application domains including marketing, advertising, political campaigning, and education. We believe that students who enter formative work experiences in IT occupations will possess better defenses against disenchantment with the IT professions as a result of an intervention based upon inoculation principles.

RESEARCH METHOD AND MODEL

Our conceptual model appears in Figure 1 below. The evidence that will support this study is based on qualitative methods as focus groups and in depth interviews to IT students who are having their first IT related job experience in different phases: before, during and after the IT job experience.
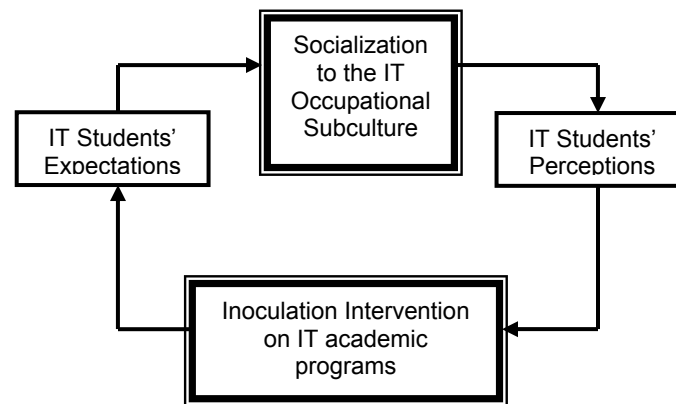
Figure 1. Initial Research Model

STATUS OF RESEARCH IN PROGRESS

We are currently conducting and analyzing focus groups with participants from four different IT schools in two academic institutions. We plan to integrate future inoculation workshops into the standard preparation path used by IT students at our academic institution who seek formative work experiences by consulting our internship office. We believe that the measures developed in the first part of the project and the intervention assessments developed for second part can be developed into a battery of self administered, web-based vocational assessments that will provide students, teachers, and internship coordinators at a variety of institutions with useful feedback concerning the match between student's vocational expectations and the known characteristics of IT occupational subculture. These methods of dissemination will make our tools and results valuable to a variety of stakeholders in higher education. Over time, dissemination of these tools and results may have a strong, positive effect on the retention of IT professionals. IN addition, academic IT programs can also benefit by including strategies that prepare IT students to perform better in their actual workplace.

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