

Student Identification with IT-Related Professions

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Abstract

The field of information systems has been bombarded by news that there are shortages of educated and qualified IS professionals. At the same time headlines in practitioner journals are showing that individuals are not entering IT-related degree programs. For the last few years, enrollments have been down in these programs across the United States. In order to explore this issue, this research project examines the identification that students have with IT-related degree programs. A field study was conducted that indicates students do identify with their chosen IT-related profession (major) and that this identification is related to both the similarity the student has with the profession prototype and with perceptions of the profession. A complete review of the study and implications are provided.

Keywords: Student identification, information systems profession, enrollment, workforce

1. Introduction

For many years now, colleges and universities in the United States have experienced declining enrollments in science, technology, engineering, and mathematics (STEM) degree programs. In particular, information technology and computer science have been significantly hard hit. Enrollment in these fields has fallen by 32 to 59 percent. (Foster, 2005) The effects of the dot-com bust and the increasing popularity of offshore outsourcing have been cited as the some of the reasons why students have not entered the IT-related disciplines. (Malykhina, 2005) Students

believe that there are no jobs. Where in fact just the opposite is true, jobs in the IT field are plentiful. In fact, the Bureau of Labor Statistics sees the need for an additional 307,000 computer-software engineers, 184,000 systems analysts, 106,000 network-systems and data-communications analysts, and 103,000 managers (Chabrow, 2004).

2. A New Approach

In order to recognize potential reasons why student enrollment has declined in IT-related educational programs, a new approach needs to be instituted. This research project uses identification as a means to exploring

what factors influence the recruitment and retention of students into IT-related programs. Identification with a profession is a powerful mechanism that impacts attitudes and behaviors of individuals. The following discussion presents the framework for this student-identification study and highlights the importance of studying identification.

In order to examine the identification of students with their chosen profession or major, it was necessary to use a framework guided by a sound theoretical foundation. Identification is an area of study that spans many disciplines including management, organizational behavior, psychology, and sociology. From this wide-range of research, there is a particular form of identification that is salient to the issues discussed related to recruitment and retention: professional identification.

Professional identification is a concept born primarily of two disciplines: sociology and psychology. The primary focus of identification in general is to help answer the question "who am I" (Babad, Birnbaum, and Benne, 1983). Different theoretical approaches have been used to study the concept. Each approach is similar in the acknowledgement that individuals have both personal and social identities. Identities are formed to meet the individual's need for a positive self-evaluation.

For students particularly, it would be very beneficial to understand what factors influence the formation of identity with their chosen major or profession. Recognizing what factors are important and salient to the individual can help in determining how programs should position themselves. Marketing efforts and strategies can then be implemented to focus only on issues relevant to potential and current students. The following discussion highlights some key factors related to the two primary approaches used to study professional identification: the sociological approach and the psychological approach.

3. Theoretical Foundations of Professional Identification

As stated, there have been two primary approaches used to study identification with a profession. The first is derived from sociology and the second from psychology. Each approach has strengths that add to our

understanding of how individuals form and maintain a connection with a group such as a profession.

The sociological approach, more commonly referred to as identity theory, focuses on roles individuals play in society and highlights the existence and importance of counter-roles. Within the context of the IT-related professions, a role could be reflected by a job title of programmer or an assignment such as project development team member. Identity theory defines factors that become important related to a specific role held by an individual. The idea of counter-roles is also key. For example, in the information technology domain there would not be the need for systems analysts if there were no users to require the system. The same would be true in a family: a mother would not exist without a child.

The psychological approach actually encompasses two theories: social identity theory and self-categorization theory. Social identity theory (Tajfel, 1978) focuses on group membership. The theory defines identification as "that part of the individual's self-concept which derives from his knowledge of his membership of a social group together with the value and emotional significance attached to that membership" (Tajfel, 1978 p. 63). Here identification is seen as group identification, as opposed to role identification. Individuals identify with a group – such as a profession. The theory defines what factors influence this identification. Self-categorization theory (Turner, 1982) focuses completely on the categorization of the individual as a group member. The two psychological approaches are seen as representing the same theoretical perspective and are typically combined under the heading *social identity theory*.

The importance of these theories to the discussion of students and why enrollments are down lies in the factors that the theories define as important to the identification process. Identification is a powerful mechanism by which attitudes and behaviors are influenced. If we can understand the factors that influence identification for students with their chosen major, we can more accurately understand how to position our programs and to draw and maintain students in IT-related programs.

Professional identification, as viewed here, is directly in line with research initiated by Ashforth and Mael (1989) on organizational identification. Organizational identification research was guided by the need and desire to understand what factors influence an individual's connection and identification with their organization – regardless of position. The focus was on identification with the group – the organization. Here, we are examining a similar idea – identification with the group – the profession. This psychological group membership is a primary determinant of an individual's social identity. Both sociological and psychological approaches to identification help define the factors examined here.

4. Importance of Identification

In research on individuals in organizations and professions, there have been many empirical studies showing the importance of identification to individual-based outcomes and behaviors. Several have highlighted the relationship of professional identification to job satisfaction (Russo, 1998; Scott, et al., 1999; Liu, Ngo, and Tsang, 2001, and Loi, Hang-yue, and Foley, 2004). Findings from these studies reveal the positive correlation between the two constructs. In an organizational context, job satisfaction has been found to strongly impact retention across disciplines. Studies were also found that relate the construct of professional identification to commitment (Landsman, 2001; Lui, et al, 2001). Both studies referenced revealed a positive relationship between professional identification and commitment to a profession. Commitment is another factor salient to the retention and the satisfaction of individuals in a professional setting. It is thus expected that if students identify with their chosen profession (represented by their choice in major), they will be more satisfied and committed and thus more likely to stay.

Within the IT domain specifically, satisfaction and commitment are two constructs that have been shown through numerous empirical studies to directly impact an individual's intention to stay with an organization. Commitment to the organization has been shown to be an important outcome variable related to intentions to turnover (e.g. Baroudi, 1985; Igbaria and Greenhaus, 1992; Igbaria,

Meredith, and Smith, 1994). Satisfaction has typically been studied at the job-level (e.g. Bartol, 1983; Goldstein and Rockart, 1984; Igbaria and Greenhaus, 1992; Gallivan, 2004). Research in the IT domain reveals the importance of satisfaction as an outcome variable. Researchers have found job satisfaction to be significantly related to organizational commitment and turnover intention for IT professionals (Thatcher, Stepina, and Boyle, 2003; Gupta, Guimaraes, and Raghunathan, 1992).

All of these past studies reveal the importance of understanding the individual's attitudes and behaviors to determine appropriate management techniques focused on recruitment and retention in the workplace. The connection of identification to these outcomes further reveals a potential source of information as well. By exploring identification, we can hopefully identify appropriate mechanisms to recruit and retain students in ways that will lead to long-term commitment and satisfaction with these technology-related professions.

5. Framework of Professional Identification

As discussed above, the importance of identification to outcomes has been empirically tested within workplace and organizational settings. Extending the concept to the educational environment, to our knowledge, has not yet been done. In order to accurately assess an individual student's identification with their chosen profession (e.g. major), it is necessary to understand the formation of professional identification for students.

Previous research highlights the importance of several factors to the formation of group identification based in both identity theory and social-identity theory. Two factors include similarity to the group's prototype and perceptions of the group (Brooks, 2006). Understanding how important these factors are to student identification can help educators and those in organizations position themselves in the most strategic and beneficial way. Each of these areas will be discussed and potential outcomes presented.

Chattopadhyay, George, and Lawrence (2004) indicate that individual's identify with social groups that highlight their perceived

similarity to the prototypical member of the group. More specifically, each person defines a group by a certain set of characteristics. These characteristics form what is termed here as the group prototype – the typical or standard member of the group. How similar a student is to this prototype is important to the identification process. For example, the more I see myself as similar to the typical IT professional, the more likely I am to identify with the IT profession. This “similarity factor” has rich potential in describing why students identify with technology-related educational programs. Previous research has shown a significant relationship between similarity and professional identification for individuals working in the information systems field (Brooks, 2006).

Extending this concept to the student would require an in-depth look at not only the construct of similarity and its properties but also to the qualitative descriptions that students associate with what we term IT or technology-related professions. A goal of collecting this information would be to extrapolate from students the attributes they most closely assign to the prototypical member of these groups. It is important to explore these attributes as a potential source of information that could impact, again, how IT-related programs are marketed.

While this seems like a simple concept, the potential information gleaned from the process could prove more valuable than many earlier efforts to understand recruitment and retention of technology-related majors. Do we have a clear picture of how others see our profession? Do people think the IT profession is made-up of only white males sitting in basements around the country drinking soda while writing code all day?

Another concept important to identification is close to the core of social identity theory as defined by Tajfel (1978). Inherent in the definition of social identity is the idea that the way a group is evaluated will impact the individual’s level of identification with the group. Again, while this seems like a simple common-sense idea, it is not one we have explored in relation to students and how they interpret perceptions of technology-related programs. These factors could prove very influential in determining why

students choose a specific degree program or profession. For example, are the mixed messages related to job availability in IT and offshore outsourcing influencing students’ decisions?

Two distinct factors of perceptions should be measured: how the individual evaluates or perceives the group and how the individual perceives *others* evaluate the group. Previous findings in organizational research support the inclusion of an evaluative component, as well as an antecedent to organizational identification (Mael and Ashforth, 1992; Pratt, 1998).

6. Research Method

In order to empirically explore these ideas, a field study was undertaken. Individuals in undergraduate technology-related programs were contacted at a private university in the Northeast. Contact was made through the course instructors. Participation in the study was voluntary. Degree programs targeted included information systems, computer science, and interactive digital design.

The field study used an online survey administered through a web interface. At the time of this writing, approximately 30 students had responded to the preliminary phase of the project. While this is a small sample, it does allow for some exploration to occur related to the concepts presented. Additional data collection is set to occur in the upcoming academic year.

Of the thirty responses received, the majority were from male students (90%). The average age of the sample was 20.3 years of age and the majority identified themselves as information systems majors (76.7%). Computer science and interactive digital design majors made up 13.3% and 10% of the sample respectively.

7. Preliminary Data Analysis

Data were collected on the primary constructs described previously: similarity to the profession prototype, perceptions of the profession, and professional identification with the chosen profession (major). Students were also asked to describe the characteristics they attributed to the typical professional in the technology-related field they have chosen to enter. The following section describes the results of the preliminary analysis.

General psychometric analysis was done for each construct. All reliabilities were well above .8. Being somewhat exploratory and due to the small sample size at this point in time, factor analysis was conducted on each construct independently. Additional analysis will be conducted in the future to assure the discriminant validity of the constructs. The perception constructs contained two reverse coded items that did not load and were thus dropped from analysis. The final number of items on the similarity construct was 5 (no items were dropped). Measures for professional identification and perceptions contained 6 items and 3 items respectively.

Simple correlation analysis was conducted to explore the relationships between the independent and dependent variables. Positive and significant correlations were found between similarity to the profession prototype and professional identification as well as between perceptions of the profession and professional identification. In order to further examine the theoretically driven relationships between the variables, similarity and perceptions were entered into a regression equation with professional identification being the dependent variable. Findings from this analysis indicate that the two independent variables explain approximately 13% of the variance in professional identification ($p=.055$).

These results are only exploratory but do point to the potential importance of these factors in shaping an individual's identification with their chosen major or profession. Additional data collection is set to occur in upcoming semesters. An added goal of this continued collection is to hopefully increase the representation of female students. It was not possible with the small sample to compare males and females on the issues presented. More information may be realized related to the lack of females in IT-related professions.

As mentioned previously, students were also asked to provide the characteristics they would use to describe the typical member of the profession they plan to enter. This is an important question in exploring the similarity concept. Findings indicated that the more similar the students see themselves compared to the typical professional in their field, the more they identify with the field. We now need to understand what

characteristics they are using to define that typical professional.

As previously stated, having only 30 responses makes analysis of this data exploratory. Preliminary examination of the qualitative responses indicated that students use the following terms to describe typical members of their chosen profession: creative, people-oriented, hard working, organized, educated, imaginative, flexible, and intuitive. The following section describes the implications that can be drawn from these findings as well as directions for future research.

8. Implications and Conclusion

Findings from this study, while exploratory, have important implications for IT-related educational programs. Identification has been shown to impact other important outcomes such as satisfaction and commitment for professionals in an organizational setting. These factors are important to retention as well. Understanding what influences the identification of students with their chosen profession can help in developing and implementing relevant programs geared toward recruitment and retention.

Two areas were found to be important in determining the identification of individuals with their chosen major: similarity and perceptions. Similarity to what the students defined as the "prototypical" IT professional was further explored by asking students to define the characteristics they attribute to this professional. Individuals should focus attention not only on the technology aspects of IT-related field but should also indicate how dynamic the field is. Students used words such as imaginative, intuitive, and people oriented to describe the prototype for their fields. These words do not match the old image of IT: working alone and crunching numbers and code.

Perceptions of IT-related professions also warrant attention. Individual identification is influenced by how the individual views the profession and how the individual perceives others view the profession. Again, this is a seemingly simple finding, but it has dramatic implications. IT-related programs should be paying close attention to what is really going on in IT. Headlines about outsourcing and offshoring are often exaggerated to gain

readers and attention. Recent research indicates that large organizations do plan on increasing their use of sourcing practices, but that does not translate to all IT jobs going to India. There a big misconception about sourcing and how organizations are implementing these strategies.

Recent research indicates that the demand for IT professionals is on the rise. It is expected that most large or Fortune 500 companies will increase staffing levels by 2008 (Zwieg, et al. 2006). Universities, colleges, and organizations must all further their marketing strategies to meet this demand. Highlighting qualities that represent characteristics important to students and their formation of identification is one way to redirect the image of the profession to one that is more representative and realistic. "Given the lead-time needed to attract, enroll, and graduate students, immediate action is needed" (Zwieg, et al. 2006, p. 106).

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