Scale to Measure Attitudes Toward Information Technology

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ABSTRACT
The current post-secondary graduation rates in computing disciplines suggest American universities are only training enough students to fill one third of the projected 1.4 million technology and computing jobs available (National Center for Women and Information Technology, 2011). Pursuit of information technology (IT) majors depends, to a great extent, on students’ attitudes toward these majors. This study developed an Attitude toward IT Scale with a gender subtext to measure college students’ attitudes toward IT. The norm group consisted of mostly freshmen enrolled in summer and fall 2011 (N = 363), at a large four-year public university in Illinois. Reliability and validity of the 30-item Scale were examined by using Cronbach’s alpha and a principal components factor analysis with orthogonal rotation using varimax with Kaiser normalization; the rotation converged in seven iterations. Results of data analyses showed that overall reliability is high (0.85), and factor analyses revealed five orthogonal factors with high coefficient alphas. This Scale may be used by educators at the senior high school and college levels to evaluate the effectiveness of different teaching/learning strategies in promoting positive student attitudes toward IT, and in improving learning among students. The Scale is unique in that it includes attitudes toward gender equality of opportunity in IT.

Keywords: Attitudes, College Students, Gender Equality, Information Technology, Scale, Validation

INTRODUCTION
Advances in information technology (IT) are among the most powerful forces bearing on the economy (Castells, 2011). IT applications continue to impact medicine, finance, manufacturing, and numerous other sectors of society. Companies that use IT often make complementary innovations in their organizations and in the services they offer. Both IT and IT-enabled organizational change are important components of the skill-biased technical change (Bresnahan, et al., 2002). Knowledge of advanced computing has the potential to prepare students to apply and innovate upon 21st-century technologies (Oh, 2003).

Several information systems studies have identified attitude as one of the strongest factors influencing successful IT use in any organization (Beaudry & Pinsonneault, 2010). Successful use of IT in a business depends not only on the technology itself, but also on the

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levels of skills and expertise of the employees using the technology (Holt & Crocker, 2000). However, these authors noted that though the skills of an individual can be improved by proper training, the attitudes of a user towards the technology will affect his/her willingness to learn about the technology, the decision to use the technology, and the actual uses to which the technology is put. The challenge of meeting the demand for skilled and willing IT professionals is addressed by examining factors that affect choice of post-secondary major and retention in computing related fields. It is therefore important to pay attention to relevant attitudes toward IT that obtain in young adults as they complete secondary education and enter into post-secondary education.

The importance of attitude in this endeavor is underscored by a consideration of the nature of attitudes. Attitude is often used to understand and predict people’s reaction to an object or change and how behavior can be influenced (Fishbein & Ajzen, 2010). Perhaps the most influential definition has been one given by Allport (1935): “An attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual’s response to all objects and situations with which it is related” (p. 810).

The most recent Taulbee survey of top-ranked North American computing, engineering, and technology programs suggests that women may account for just 15% of the undergraduate student body, and a miniscule 0.4% of first-year women college students list computing as a probable major (Misa, 2010). Numerous research studies have uncovered reasons women in particular have not chosen computing: negative stereotypes, an unattractive/hostile culture, misperceptions of the discipline, lack of role models and/or mentoring support, and low confidence (Beyer et al., 2003; Katz et al., 2006). In relation to gender differences in computer-related attitudes in general, research has shown that male students have more positive attitudes towards computers — including greater liking, than female students (Aijabri, 1996; Bebetsos & Antoniou, 2009; Tsai, Lin, & Tsai, 2001). Therefore, the shortage of skilled IT professionals is may be due in part to negative attitudes toward IT in young adult females, and efforts to improve those attitudes are much needed.

**Background and Need for the Study**

In direct response to the concern about shortages of IT workers in the United States (NSF, 2002), the authors of this study were funded by the US National Science Foundation (NSF) to pursue a project to recruit more students, especially females, into IT-related majors at their home institution by attempting to improve certain attitudes of students, especially female students, towards IT. This project needed a method for measuring the impact of various project curricular interventions on relevant male and female student attitudes, so as to be able to relate that impact to decisions to enroll in IT coursework or not to enroll in such coursework.

Although there are many instruments available that measure attitudes toward computing (Bhattacherjee & Premkumar, 2004; Moore & Benbasat, 2001; Osborne et al., 2003; Palaigeorgiou et al., 2005; Pierce et al., 2007; Reid, 2006; Richter et al., 2000; Roussos, 2007; Selwyn, 1997; Sudas & Lurasova, 2006), none focused on the set of attitudes we were most concerned to measure, including level of interest in learning about IT subject matter, perceptions of the social utility of IT, and attitudes toward female participation in IT. We concluded that a new instrument needed to be developed and validated to meet our needs, and the needs of others with similar IT recruitment and retention goals.

**Purpose of the Study**

The purpose of this study was to develop a valid and reliable Scale to measure certain attitudes of undergraduates (especially freshmen) toward IT — a Scale short enough to be used with a general population of students who have no particular special motivation to complete the
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