

A Preliminary Study on the Factors Related to Students' Occupational and Academic Pursuits in Computing

Patrick Chang Boon Lee

Faculty of Business Administration
University of Macau

Abstract

This research draws on the theory of planned behaviour to investigate the factors that are related to students' occupational and academic pursuits in computing. The findings of this research may help manpower planners, educators, and career counsellors understand why students are attracted to the computing profession. Effective plans can then be established to relieve the shortage of computer professionals. This study has collected the required data for analysis. The researcher will present the results during the conference.

Keywords

Planned behaviour, Occupational and academic pursuits, Computing,

INTRODUCTION

The rapid growth of the computing industry over the last few decades has increased the demand for computer professionals. The supply of computer professionals, however, has not kept pace with the demand. The resulting shortage is problematic because employers could not find trained personnel to fill the jobs. To overcome this problem, employers often have to offer better compensation to attract and retain staff. These measures, however, are not long-term solutions. They do not overcome the shortage problem. They may even aggravate the problem by increasing personnel turnover and escalating employment costs.

Employers have also used another strategy to overcome the shortage of computer professionals. That is, they recruit from overseas. This is a quick and easy fix because the shortage is addressed instantly. Unfortunately, international recruitment is not likely to be sustainable because it is difficult to maintain a long-term foreign worker immigration policy. Furthermore, international recruitment may become costly.

One practical solution to minimize the shortage is to increase the local pool of trained manpower. Although this solution takes time to implement, it is an important solution. Indeed, we need to pay attention to this solution because there have been reports that student enrolment in computer courses is not up to expectations. The issue, then, is how can we attract students into the computing profession?

The purpose of this study is to determine factors that are related to students' occupational and academic pursuits in computing. This objective includes determining whether there are gender differences with respect to the factors. There are three reasons why research on factors affecting pursuits in computing is important. First, there have not been many systematic studies on this topic. As a result, we do not have a clear understanding why some students are attracted to computing while others are not. The second reason is that most studies have given anecdotal evidence to support why some women like or dislike computing (Trauth, 2002). There are few empirical studies that show why women are not keen to join the computer workforce. The third reason is that the results of this research might be valuable to a number of people – namely, researchers, educators, employers, manpower planners, and occupational counsellors. For example, if manpower planners know the factors that relate to students' intentions to pursue computing careers, then they would be able to strategize effectively on ways to increase the manpower requirements and hence relieve the shortage of personnel in the computing industry.

THEORETICAL FRAMEWORK

This study will use the theory of planned behaviour (Ajzen, 1991) as the framework for research. This theory has been found to be very successful in predicting a wide range of behaviour (Madden et al., 1992). It is reasonable to believe, therefore, that the theory will provide a good foundation to investigate the behaviour that is of our interest, that is, factors that relate to students' occupational and academic pursuits in computing. It should be noted that even though the theory has been applied in many situations, it has not been frequently employed to good effect in occupational settings. This study, therefore, will test the usefulness of the theory in the current research context.

The theory of planned behaviour is an extension of the theory of reasoned action. Both the theory of planned behaviour and the theory of reasoned action are based on the proposition that an individual's behaviour is determined by the intention to perform that behaviour. The stronger the intention to perform the behaviour, the greater the likelihood that the individual will engage in the behaviour.

The theory of reasoned action attempts to predict behavioural intentions based on attitudes and subjective norms. Attitude is defined as "a person's general feeling of favourableness or unfavourableness for that behaviour" while subjective norm is defined as a person's "perception that most people who are important to him think he should or should not perform the behaviour in question." (Ajzen and Fishbein, 1980). The theory further posits that attitude is the product of two components – namely, one's salient belief that performing the behaviour will lead to certain outcomes, and the evaluation of the outcomes. Subjective norm is also the product of two components – namely, one's normative belief regarding whether the salient referent thinks the person should (or should not) perform the behaviour, and the motivation to comply with that referent.

Researchers have noted, however, that the predictive validity of the theory of reasoned action becomes problematic when the behaviour under study is not under full volitional control. Ajzen (1988) recognized that for some behaviour, there may be personal deficiencies – for example, skills, abilities, knowledge, and adequate planning – while for others, there may be external obstacles, such as time or opportunity, that may limit the behaviour in question. The theory of planned behaviour, therefore, extends the theory of reasoned action by including a third determinant called perceived behavioural control. Perceived behavioural control is defined as "people's perception of the ease or difficulty of performing the behaviour of interest" (Ajzen, 1991). It is the product of control belief and perceived facilitation. Control belief is the perception of the presence or the absence of requisite resources and opportunities needed to carry out the behaviour. Perceived facilitation refers to one's assessment of the importance of resources required to achieve the outcomes.

The theory of planned behaviour has been successfully applied to various situations in predicting the performance of behaviour and intentions, such as predicting user intentions to use a new software (Mathieson, 1991), to perform breast self-examination (Yong et al., 1991), and to avoid caffeine (Madden et al., 1992). Madden et al (1992) have found that the theory of planned behaviour has a better predictive power of behaviour than the theory of reasoned action.

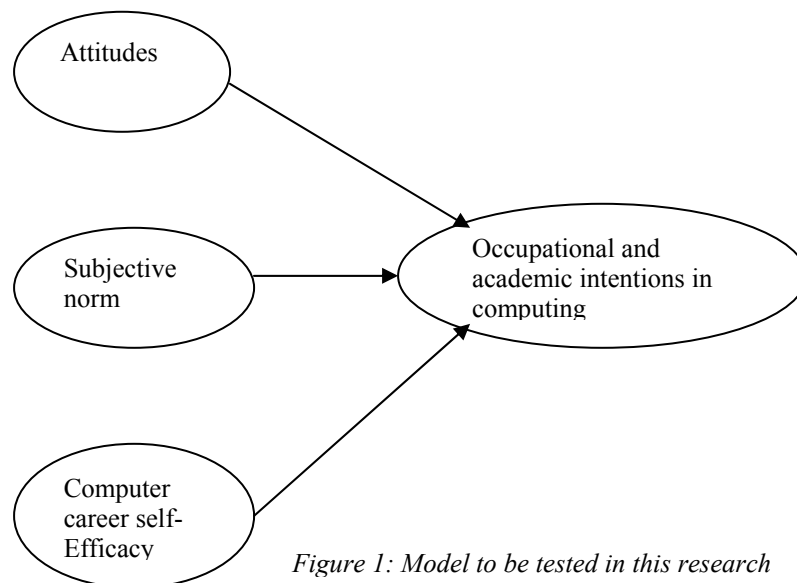
Even though the theory of planned behaviour has been well accepted, a few researchers have indicated the need to clarify the conceptualisation of perceived behavioural control (Giles and Larmour, 2000). On the one hand, Ajzen (1991) likens perceived behavioural control to Bandura's concept of self-efficacy (Bandura, 1997), which is concerned with judgements of how well one can execute a course of action required to deal with prospective situations. On the other hand, perceived behavioural control is also conceptualised as the extent a person has control over the performance of the behaviour in question. It may be possible that perceived behavioural control represents a combination of self-efficacy and perceived control.

Recent research has indicated that self-efficacy and perceived control are theoretically distinguishable and that they influence behaviour in different ways. Specifically, self-efficacy influenced intentions but not actual behaviour, and perceived control has no effect on intentions but is a significant predictor of actual behaviour (Terry and O'Leary, 1995).

In prior research that focuses on self-efficacy of career choice, Betz and Hackett (1981) have found that self-efficacy perceptions are significantly related to interest for particular occupations. They found that the stronger people's self-belief in their capabilities, the more career options they consider possible, and they prepare themselves better for their pursuits. People, therefore, prefer occupations they feel they are capable of assuming. Thus, it seems logical to suggest that self-efficacy in computer career would be an important variable that would influence people's intention to pursue the computing profession.

While a number of studies have studied the relationship between career self-efficacy and career intentions (Betz and Hackett, 1981; Lent, Brown and Hackett, 1994), few have examined career intentions in the context of a larger theoretical framework, such as the theory of planned behaviour. This study, therefore, seeks to fulfil the objective of investigating the roles of attitudes and subjective norms, as well as computer career self-efficacy as determinants of college students' intentions to pursue careers or further studies in computing.

Figure 1 shows the model that will be tested in this research. This is an initial study and it does not attempt to test every component of the theory of planned behaviour. This study, therefore, will not examine the antecedents of attitudes, subjective norms, and self-efficacy. Also, due to the use of cross sectional data, this study will not examine the relationship between intentions and behaviour.



RESEARCH METHOD

The data for this study were gathered from a questionnaire survey distributed to students in five colleges in Singapore. Singapore is an appropriate place to conduct the study because it has a small pool of computer professionals. Singapore anticipates that it would require many more computer professionals over the next few years, due to continued expansion of its information communication industry. One indication of how serious the authorities are in relieving the shortage problem is shown by the establishment of a scheme that provides incentives for non-computer working professionals to switch to work as computer professionals. These incentives include subsidies for course fees and salaries for personnel to attend computer courses.

College students were chosen for this study because they are at the cross road of deciding their future career upon finishing their studies. Whether the students intend to continue studying or to join the labour force, they were likely to have given some thoughts about their future occupation.

Three research assistants separately approach students in the colleges to request their voluntary participation in the survey. They explained that the survey was about occupational and academic pursuits in computing and emphasized that there were no right or wrong answers. The students were told that their individual responses would be kept confidential and that no names were required in the survey form. The research assistants waited while the students answered the questionnaire. In one college, the research assistants approached the principal for assistance. The principal agreed to ask her teachers to distribute the questionnaires. The research assistants then collected the completed questionnaires from the principal a few days later.

MEASURES

The items used to measure the constructs are discussed the following section. To facilitate ease in responding to the questions, the answer format for the entire questionnaire was based on a seven-point Likert-type scale that indicates the extent of agreement or disagreement with the questionnaire items.

Intentions. Four items were adapted to measure intentions to pursue computer related studies/work after college. These items were based on reviews of prior studies on intentions. For example, one item asked respondent for the extent of agreement or disagreement with the following statement, "I intend to pursue computer related studies/work after my exams."

Attitudes. Four items were used to measure attitudes. These items were adapted from the prior studies involving attitudes. An example of an item used in this study was "I like to become a computer professional."

Subjective norms. Two items were created to measure social norms. The referents for social norms were the respondent's parents and friends. For example, an item asked for the extent of agreement or disagreement with the following statement, "My friends feel that it is 'cool' to work in a computer-related field."

Computer career self-efficacy. Prior research has indicated that self-efficacy assessments tailored to particular domains yield more predictive utility (Betz & Hackett, 1983). This research, therefore, created three items to measure computer career self-efficacy. The items were created based on reviews from prior studies (Giles and Rea, 1999). An example of the item was "I am confident that I can gain the qualification to become a computer professional."

RESULTS

A total of 312 complete responses were gathered for the survey. The study is currently in the analysis stage. The data will be analysed using structural equations. The researcher will present the results of the analysis during the conference.

REFERENCES

- Ajzen, I. (1988). *Attitudes, personality and behaviour*. Milton Keynes, UK: Open University Press.
- Ajzen, I. (1991). The theory of planned behaviour, *Organizational Behaviour and Human Decision Processes*, 50, 179-211.
- Ajzen, I. and Fishbein, M. *Understanding Attitudes and Predicting Social Behaviours*, Prentice-Hall, New Jersey, 1980.
- Bandura, A. (1997). *Self-efficacy: The exercise of self control*. New York: Freeman.
- Betz, N.E., and Hackett, G. (1981). The relationship of career-related self-efficacy expectations to perceived career options in college women and men. *Journal of Counseling Psychology*, 28, 399-410.
- Giles, M. and Rea, A. (1999) Career self-efficacy: an application of the theory of planned behaviour, *Journal of Occupational and Organizational Psychology*, 72, 393-398.
- Lent, R.W., Brown, S.D., and Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior*, 45, 79-122.
- Madden, T.J., Ellen, P.S., and Ajzen, I. (1992). A comparison of the theory of planned behaviour and the theory of reasoned action. *Personality and Social Psychology Bulletin*, 18, 3-9.
- Mathieson, K. (1991). Predicting user intentions: comparing the technology acceptance model with the theory of planned behaviour, *Information Systems Research*, 2:3, 173-191.
- Terry, D.J. and O'Leary (1995). The theory of planned behaviour: The effects of perceived behavioural control and self-efficacy. *British Journal of Social Psychology*, 34, 199-220.
- Trauth, E.M. (2002). Odd girl out: an individual differences perspective on women in the IT profession, *Information Technology & People*, 15 (2), 98-118.
- Young, H. M., Lierman, G., Powell-Cope, D. Kasprzyk and Benoliel J.Q. (1991). Operationalizing the theory of planned behaviour, *Research in Nursing and Health*, 14, 137-144.

COPYRIGHT

Patrick C.B. Lee © 2003. The authors assign to ACIS and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to ACIS to publish this document in full in the Conference Papers and Proceedings. Those documents may be published on the World Wide Web, CD-ROM, in printed form, and on mirror sites on the World Wide Web. Any other usage is prohibited without the express permission of the authors.