THE FACTORS THAT HAVE AN IMPACT ON STUDENTS' COMPUTER SELF-EFFICACY AT TROY UNIVERSITY, ALABAMA

by

BELINDA A. CASIMIR

A THESIS

Submitted in partial fulfillment of the requirements
for the degree of Master Of Science
in Computer Science
in the Graduate School of
Troy University

JULY 2010

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

THE FACTORS THAT HAVE AN IMPACT ON STUDENTS' COMPUTER SELF-EFFICACY AT TROY UNIVERSITY ALABAMA

Submitted by Belinda A. Casimir in partial fulfillment of the requirements
for the degree of Master of Science
in Computer Science
in the Graduate School of
Troy University

Accepted on behalf of the Faculty of the Graduate School by the thesis committee:

Emrah Orhun, Ph.D.
Chair

5/12/2010
Date

Matthew Mariano, Ph. D.

Sunil Das, Ph.D.

Irem Ozkarahan, Ph.D.
Chair Department of Computer Science

Frederick M. Beatty Ph.D.
Associate Dean College of Arts and Sciences

Hal Fulmer, Ph.D.
Dean College of Arts and Sciences

Dianne L. Barron, Ed.D.
Associate Provost and
Dean of the Graduate School

June 23, 2010
Date

JULY 2010

ABSTRACT

THE FACTORS THAT HAVE AN IMPACT ON STUDENTS' COMPUTER SELF-EFFICACY AT TROY UNIVERSITY, ALABAMA

Belinda A. Casimir

Women are seriously underrepresented in computing education programs particularly at the undergraduate level in the United States. Computer self-efficacy has been identified as a key determinant of an individual's beliefs and behavior in using computers and a major determinant of student performance in software training and enrollment in college-level computing courses. This thesis considers computer self-efficacy and its relationship to organizational culture, gender and educational background. The purpose of the study conducted was to explore the factors that influence computer self-efficacy in an introductory computing course. Participants were undergraduate students (n=310) enrolled in several sections of the Introduction to Computer Concepts course at Troy University, Alabama. Students were given an in-class survey at the end of the semester that was designed to measure their perceptions of computer self-efficacy and various dimensions of organizational culture, as well as their perceptions of and intentions regarding computer science as a field of study. The results indicate that while organizational culture factors influenced students' computer self-efficacy beliefs, differences existed in computer self-efficacy perceptions in connection with gender. Additionally students' plans to enroll in further computing courses were correlated with their gender as well as their computer self-efficacy perceptions.

Human or Animal Subjects Review
for

Belinda A. Casimir

THE FACTORS THAT HAVE AN IMPACT ON STUDENTS' COMPUTER SELF-EFFICACY AT TROY UNIVERSITY, ALABAMA

This research project has been reviewed by the Research Review Board and approved as follows (the appropriate block must be checked by either the Thesis chair or the Chair of the Research Review Board):

☑ **Neither humans nor animals** will be used and this research is certified exempt from Research Review Board review by the thesis committee chair.

☐ **Human participants** will be used and this research is certified exempt from Research Review Board review by the thesis committee chair.

☐ **Human participants** will be used and this research was reviewed and is approved by the Research Review Board.

☐ **Animal participants** will be used and this research was reviewed and is approved by the Animal Research Review Board.

Signature of Thesis Committee Chair	Date	Approved or Rejected
Lynn Schrum	May, 2010	Approved
Signature of Chair of Research Review Board	Date	Approved or Rejected

DEDICATION

This thesis is dedicated to my parents Aurelia and Gary Casimir and my family for their support and encouragement throughout my graduate study.

ACKNOWLEDGMENTS

I owe a debt of gratitude to many people who have helped me along the way to completion of this project. Foremost, I would like to thank Dr. Emrah Orhun for inviting me to be a part of this university research project, and for providing me with the support necessary to complete this project.

I would like thank the thesis committee for their assistance. I would also like to thank Dr. Nedret Billor and Chih-hsuan Wang for their substantial contributions to my thesis.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF SYMBOLS AND ABBREVIATIONS

AGFI - Adjusted Goodness-of-Fit
AMOS - Analysis of Moments Structures
BIS - Banking Information Systems
CAD - Computer Aided Design
CFA - Confirmatory Factor Analysis
CFI - Comparative Fit Index
CM – Climate and Morale
CR - Critical Ratio
CS – Computer Science
CSE - Computer Self-Efficacy
df- Degrees of Freedom
GCSE - General Computer Self-Efficacy
GFI - Goodness-of-Fit
I - Involvement
IF – Information Flow
IU - Individual's Intentions to Use
M - Meeting
n – Numerical value
NFI - Normed Fit Index
PCS – Perceptions of Computer Science
PCSE - Profession-Oriented Computer Self-Efficacy
PEOU - Perceived Ease of Use
PU - Perceived Usefulness
RMSEA - Root Mean Square Error of Approximation
RMSR – Root Mean Square Radius
S - Supervision
SE - Standard Error
SEM - Structural Equations Modeling
StDev - Standard Deviation
TAM - Technology Acceptance Model
TCSE - Task Specific Computer Self-Efficacy
TLI – Tucker-Lewis Index
TM - Teamwork
χ^2 - Chi Square

CHAPTER ONE: INTRODUCTION

A student's expertise and skill in using computer systems has become a critical factor for academic success and enrollment in computer courses (Byrom & Bingham, 2001). According to the Merriam-Webster Online Dictionary (2010) the word *student* is derived from the Latin verb *studēre*, meaning "to direct one's zeal at"; hence a student could be described as "one who directs zeal at a subject." In a college setting, students direct their attention to courses that they are familiar with and usually major in fields that they are talented in or have a vested interest in. The extent to which students select computing related courses and majors depend largely on students' knowledge of working with computers and their willingness to use computers. Research has consistently found that self-efficacy beliefs determine whether an individual will choose to engage in certain behaviors, and if so, how much effort is expended on that behavior (Tasa & Seijts, 2006). In forming a self-efficacy belief, a person assesses the availability of specific resources (e.g., skill level and knowledge of task-relevant strategies), and the constraints (e.g., task complexity and time) when performing the task (Gist & Mitchell, 1992). The stronger one's perceived self-efficacy, the more vigorous and persistent one's effort (Bandura, 1995). Individuals with low self-efficacy tend to over-estimate the difficulty of a task, which consequently causes stress and narrows one's vision for solving learning challenges (Compeau & Higgins, 1995).

There can be many factors that may cause individuals to have low confidence in their computing abilities. Factors that affect computer usage in a university environment include academic requirements, class status, gender, and age (Kvavik, Caruso, & Morgan, 2004). Research suggests that technology savvy students tend to prefer

teamwork, experiential activities, and the use of technology (Kvavik et al., 2004). Kvavik et al. (2004) also discovered that academic usage of technology was strongly related to a student's academic major and class status; with engineering and computer science students usually having the highest preference for technology in the classroom. This suggests that student academic culture may have a direct impact on computer self-efficacy and an increase in computer self-efficacy may increase enrollment in computer related courses and majors. The aim of this study is to have a better understanding of how a student's computer self-efficacy and decision to enroll in computer courses are shaped. The objective is to examine the relationship between organizational culture and computer self-efficacy and to determine the effects of gender, age, and experience on a student's computer self-efficacy.

The approach taken to achieve the stated objective for this study involved: 1) studying the factors developed by Glaser, Zamanou, and Hacker (1987) to gain an understanding of organizational culture; 2) developing a valid research model for testing the hypotheses; 3) gathering data necessary for testing the theoretical model; 4) choosing a data analysis technique; 5) evaluating the results; and 6) reporting the conclusions of the study.

Chapter One, Introduction, explains the nature of the research problem and the objective of the study. Chapter Two, Literature Review, provides the theoretical background for this study, discussing key areas that involve organizational culture, computer self-efficacy theories, and moderating factors of computer self-efficacy. This chapter offers an extensive literature review of the different factors that are believed to have effects on computer self-efficacy investigated by other researchers. The research

model, hypotheses, materials, and methods used for gathering, analyzing, and testing the data are outlined in Chapter Three. Chapter Four interprets the results of the study. Chapter Five discusses additional structural models that were explored for achieving adequate model fitness. Chapter Six discusses the findings and relates them to previous research studies. This chapter also covers the limitations of the methods of data collection used. Finally, Chapter Seven summarizes the overall study, points out the significance of the results to the university setting, and offers suggestions for future research.

CHAPTER TWO: LITERATURE REVIEW

This chapter provides the theoretical background for this study and discusses key areas that involve computer self-efficacy theories, organizational culture, and moderating factors of computer self-efficacy. The culture of a group can be defined as a pattern of shared basic assumptions that the group has learned as it solves its problems of external adaptation and internal integration, 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 (Shein, 2004). Dill (1982) explored the issue of student academic culture and concluded "we are members of academic communities but we manage academic organizations." In this study, student academic culture is observed as organizational culture as it relates to the university setting. In academic cultures the organization provides a stable environment in which students can develop and exercise their skills (Harris, 1994). Student academic culture provides an instructional framework and guidance on issues like how academic success is achieved, the use of technology, how students think, and standards for interaction and communication. Most researchers have studied the concept of organizational culture as it relates to business (Orhun & Mason, 2008; Sheng et al., 2003; Brown, 1992; Yeung et al., 1991) but there are very few examples of applications to academic settings. In essence, both settings (academic and business) offer organizational values and norms shared by individuals in these organizations that control the way they interact with each other. Organizational values express preferences for certain behaviors or certain outcomes whilst organizational norms express behaviors accepted by others (Harris, 1994). To measure the behaviors and beliefs characteristic of this academic group, the organizational culture model developed

by Glaser et al. (1987) was adopted. Since an individual's classroom environment and interactions with others can affect how they react to certain circumstances and their perception of their abilities (Bandura's, 1997), the organizational culture model was deemed the appropriate model in exploring the factors that affect student academic culture in a university setting.

THEORETICAL MODELS FOR SELF-EFFICACY

Self-efficacy by definition is intended to facilitate the forming of behavioral intentions, the development of action plans, and the initiation of action (Bandura, 1997). As a moderator, self-efficacy can support the translation of intentions into action. Many researchers have explored different models in an aim to obtain valuable information related to or confirming self-efficacy beliefs. The following models show similarities and differences among researchers in their quest to determine factors that influence and affect self-efficacy beliefs among individuals. The model (Figure 2.1) developed by Albert Bandura (2001) hypothesized that guided exploration will produce stronger self-efficacy and greater satisfaction following practice than enactive (self-directed) exploration. His model formulates that enactive exploration will produce greater intrinsic motivation following practice than guided exploration, but that enactive exploration will produce greater wasted effort in the form of errors, repetition of search lines, and incomplete development of search statements in post-training tasks than guided exploration. The results of the study revealed that guided exploration was more effective in developing post-training self-efficacy and that enactive exploration participants wasted more time and were more prone to making errors.

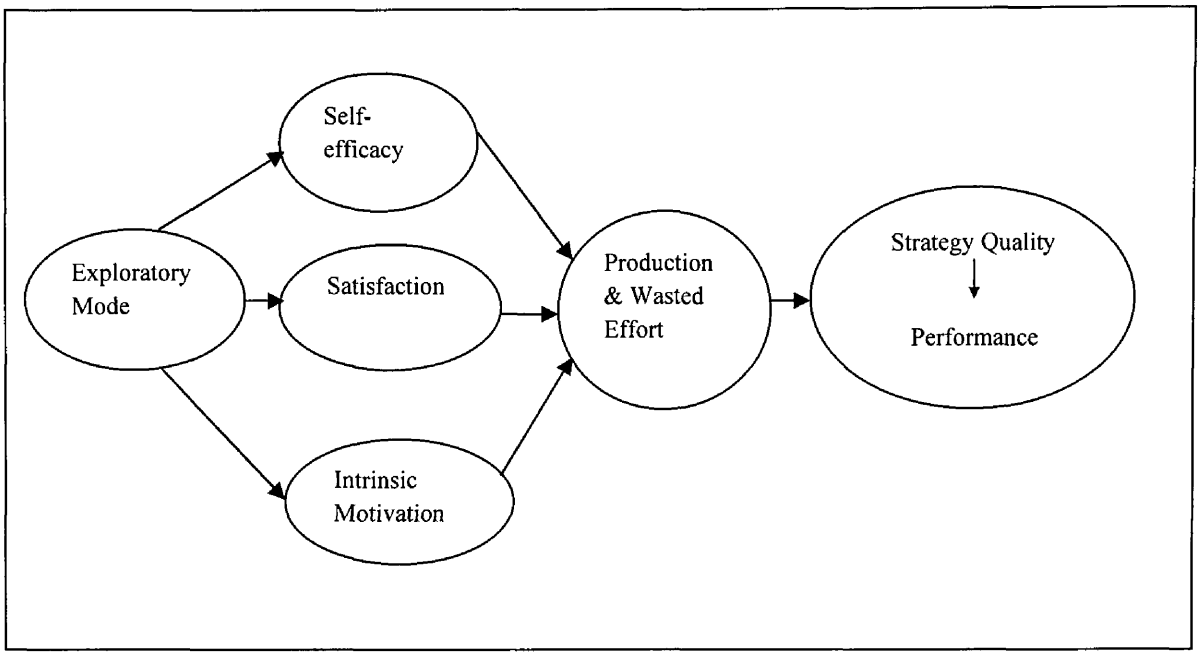


Figure 2.1The model of Bandura (2001) displaying the factors believed to have an impact on self-efficacy and how self-efficacy is related to performance.

Fernández-Ballesteros, Diez-Nicolas, Caprara, Barbaranelli, and Bandura (2002) examined people's beliefs that through the exercise of their collective voice, their society can accomplish desired social changes. In the first segment of this conceptual model, it was hypothesized that socioeconomic status affects perceived collective efficacy only indirectly through its influence on perceived personal and individual social efficacy. To determine the validity of this claim, a model was developed and tested (Figure 2.2). The results of the study found that the stronger the perceived collective efficacy, the higher the groups' motivational investment in their undertakings, the stronger their staying power in the face of impediments and setbacks, and the greater their performance accomplishments. Figure 2.2 presents the structural model developed by Fernández-Ballesteros et al. (2002) specifying the impact of socioeconomic status on perceived efficacy, and the paths of influence among the three forms of efficacy belief systems.

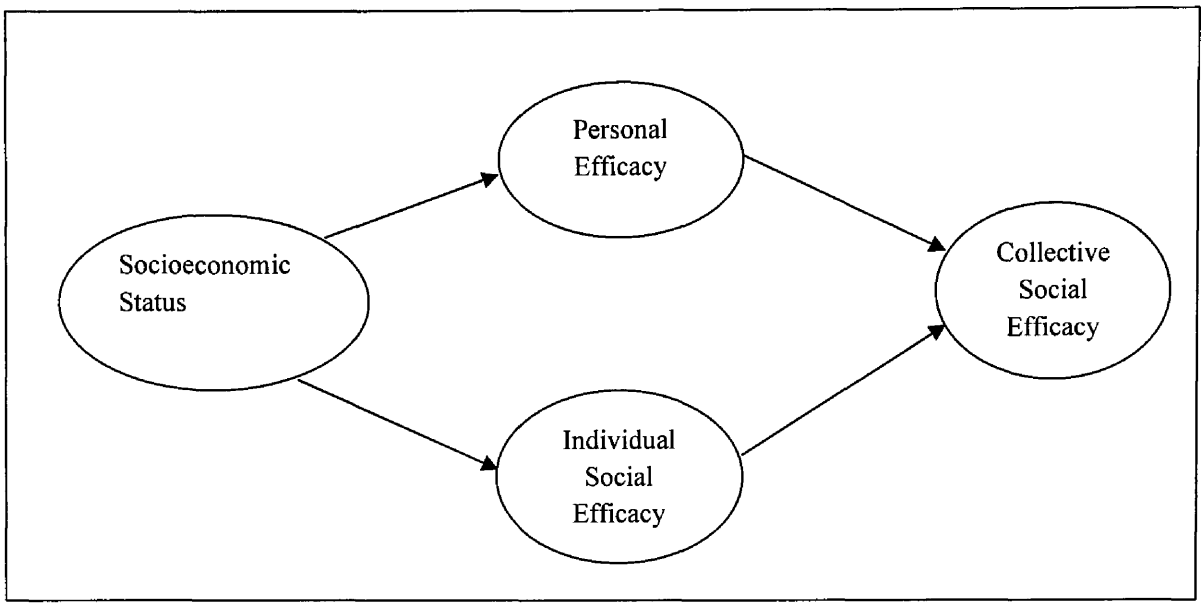


Figure 2.2 Fernandez-Ballesteros et al.'s (2002) model displaying factors believed to have effects on perceived collective social efficacy.

Stephens (2006) believed that computer literacy expectations should be far different across professional fields and different professions would include different skills in their self-efficacy scales. Marakas, Yi, and Johnson, (1998) broke computer self-efficacy (CSE) into two categories: task specific computer self-efficacy and general computer self-efficacy. Task specific computer self-efficacy (TCSE), as the name indicates, considers self-efficacy in terms of specific computer related tasks. For example, research might focus on a subject's belief in his or her ability to develop a spreadsheet to solve a particular problem (Marakas et al., 1998). General computer self-efficacy (GCSE) examines computer self-efficacy over the complete spectrum of computing. General computer self-efficacy aggregates individual task-specific computer self-efficacy into a single broad-based measure of computer self-efficacy. In research, GCSE might be used to assess gender differences to discuss why men are more likely to choose information technology as a profession (Busch, 1995). Stephens and Shotick (2002) introduced a new form of computer self-efficacy called profession-oriented

computer self-efficacy (PCSE). PCSE is a collection of TCSEs needed to work in a particular profession. PCSE is a subset of GCSE (Figure 2.3). A task in engineering might entail the ability to use Computer Aided Design (CAD) software; in advertising it might mean the ability to use publishing software to create brochures; in multi-media it might mean the ability to use simple photo editing software to incorporate images in electronic media; and in Chemistry it could include the ability to interact with instrumentation software in the lab (Stephens, 2006). Therefore, each specialized professional area should create a specific scale targeting the computer-related skills for that vocation. Researchers can then use these specialized scales to do targeted research in specific professions. Based on these beliefs, Stephens (2006) generated a model designed to target students in areas of general, profession-oriented, and application specific computer self-efficacy.

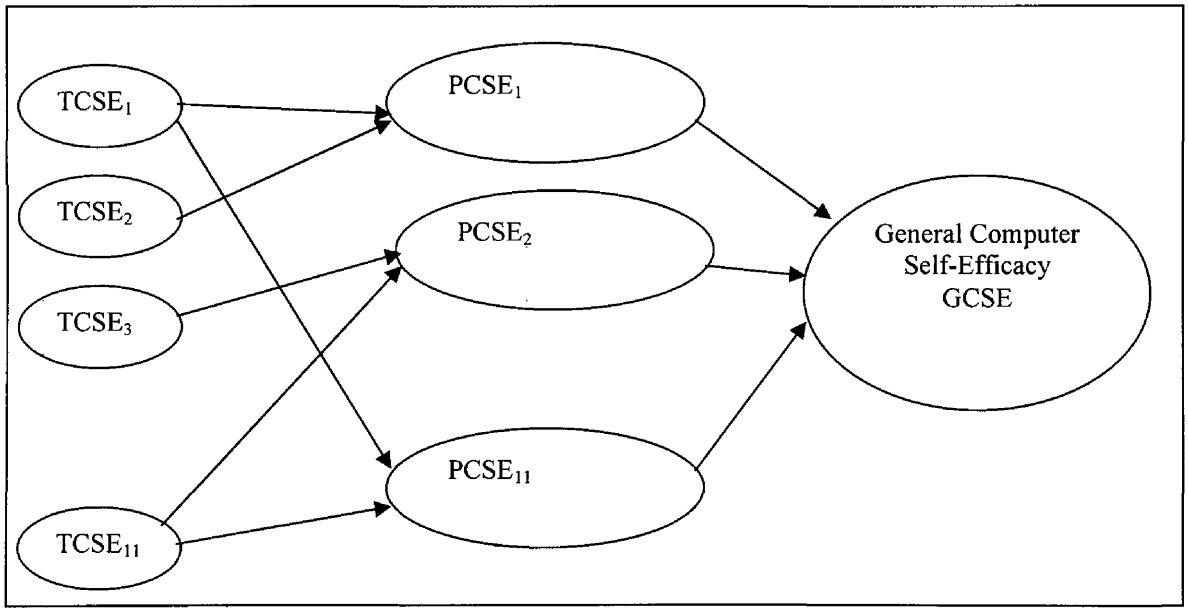


Figure 2.3 Computer self-efficacy model by Stephens and Shotick (2002).

Deng, Doll, and Truong (2004) suggested three antecedents (learning capabilities, user autonomy, and collegial support) of computer self-efficacy and their linking mechanisms in the ongoing use context (Figure 2.4). Since knowledge and expertise enhance self- efficacy beliefs, learning capabilities (task knowledge, computer knowledge, and problem solving expertise) and collegial support are plausible antecedents of computer self-efficacy. In the ongoing use context, users are more active and self directed. This autonomy in problem solving may also have implications for enhancing self-efficacy. In this model, four mechanisms—perceived problem solving ability, ability to experiment, sense of personal causality, and ability to marshal the expertise of others—provide an explanation for how learning capabilities, user autonomy, and collegial support enhance computer self-efficacy.

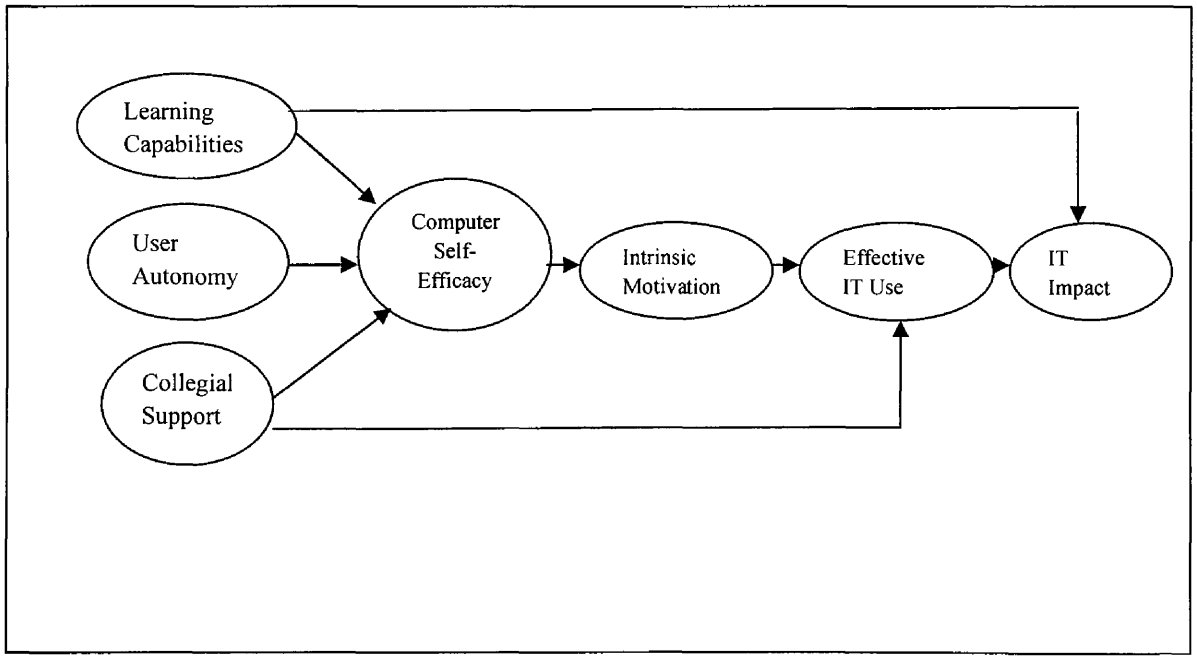


Figure 2.4 Computer self-efficacy model by Deng et al. (2004).

Figure 2.5 provides an overview of the conceptual model used by Reid and Levy (2008) to illustrate the effects of integrating trust and computer self-efficacy with traditional Technology Acceptance Model (TAM) constructs. Consistent with work done by Byrne (2001), this study used Structural Equations Modeling (SEM) to assess the impact of trust as well as computer self-efficacy on the classical TAM's constructs (perceived ease of use (PEOU), perceived usefulness (PU) and an individual's intentions to use (IU) banking information systems (BIS)) and their overall impact on customers. Research results showed that while computer self-efficacy did not positively impact trust and perceived ease of use, computer self-efficacy significantly and positively predicted perceived usefulness. Additionally, trust positively impacted perceived ease of use and perceived usefulness, while perceived usefulness significantly predicted intentions to use banking information systems. It was also observed that of all the constructs examined, only trust varied significantly among males and females with males having higher mean trust scores than females.

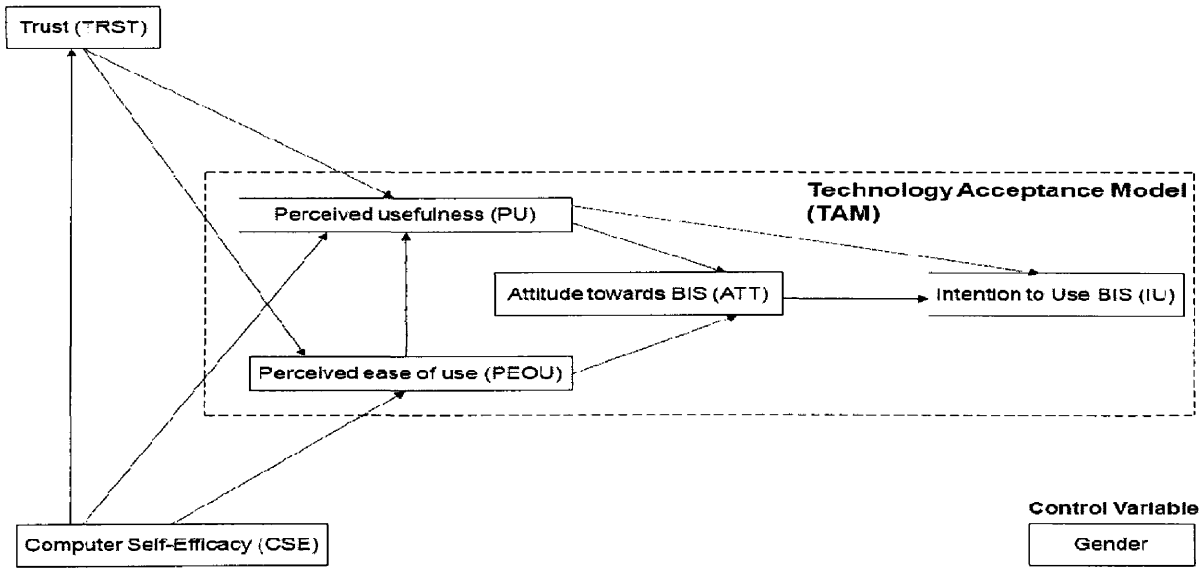


Figure 2.5 Conceptual model extending the classical TAM with Trust and CSE by Reid and Levy (2008).

Braak and Goeman (2001) aimed to identify determinants of self-perceived computer competence among undergraduate social sciences students. They utilized a survey that gathered socio-demographic information, computer experience, intensity of computer use, computer attitudes, diversity of computer applications used, and in-depth knowledge of basic computer applications. Computer attitudes were found to be the strongest determinant of self-perceived computer competency. Positive attitudes toward computers in turn seemed to be mainly influenced by computer experience and intensity of computer use. The two experience measures were found to directly impact computer competence. The effects of gender was found to be statistically moderate, male students showed more favorable attitudes toward computers as opposed to female students. Males also reported higher rates of computer competence.

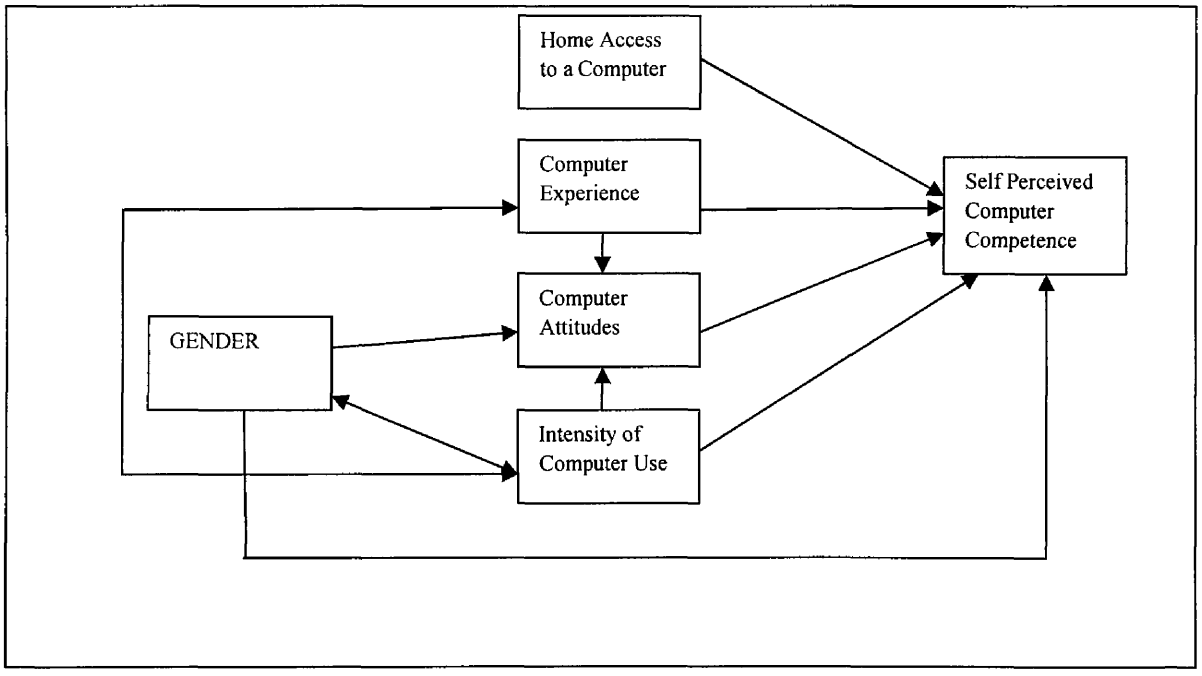


Figure 2.6 Determinants of self-perceived computer competence by Braak and Goeman (2001).

PRIOR STUDIES ON COMPUTER SELF-EFFICACY

Students clearly benefit from instructors and support staffs that help them develop a sense of academic confidence, cultivate their aspirations, and find meaning and direction in their pursuits (Bandura, 1997). Bandura (1986) emphasizes that one's mastery of experiences is the most influential source of self-efficacy information. Social cognitive theory suggests that individuals with high self-efficacy have greater confidence in their capability to complete computer-mediated tasks, thus are more likely to set more challenging goals and be more committed to these goals than individuals with low efficacy (Locke et al. 1984; Taylor et al. 1984; Gardner & Rozell, 2000). Harrison (1997) showed that an increased performance with computer-related tasks was found to be significantly related to higher levels of computer self-efficacy.

The perceived knowledge about a specific task or about an environment is expected to influence one's self-efficacy (Torkzadeh & Doll, 1999). Mento, Cartledge, and Locke (1980) found that perceived task ability significantly affected performance even after controlling for other variables. Whether people will make an effort to handle a given situation depends on the strength of their effectiveness beliefs (Torkzadeh et al., 2003). At the initial level, Bandura (1986) suggested that perceived self-efficacy influences choice of behavioral settings. When people believe that their coping skills are insufficient to deal with threatening situations, they avoid them. On the other hand, if people believe that their coping skills exceed that of the coping skills required to complete a specific task, they may willingly choose to engage in those situations (Bandura, 1986). In anticipation of eventual success, perceived self-efficacy also affects coping efforts once they are initiated and individuals who view themselves as capable of

performing tasks will tend to do so successfully (Bandura, 1986). In clarifying the relationship of self-efficacy and performance, perceptions of efficacy serve as a behavioral predictor (Bandura, 1986).

Efficacy judgments also include motivational and integrative aspects (Gist & Mitchell, 1992). Motivation is the process whereby goal directed activities are instigated and maintained (Schunk, 2000). A student with a high degree of motivation towards success in a course will likely be more successful (Roberts & Dyer, 2003). Computer self-efficacy may enhance a user's intrinsic motivation with computer-mediated work (Arnold, 1985). Compeau and Higgins (1995) identified encouragement by others and the use of organizational support as having a significant influence on computer self-efficacy. Schunk (1989) discussed how self-efficacy influences academic learning processes. At the start of an activity, students hold differing beliefs about their capabilities to acquire knowledge, perform skills, master the material, and so forth. Initial self-efficacy varies as a function of aptitude (e.g., abilities and attitudes) and prior experiences. Personal factors such as goal setting and information processing, along with situational factors (e.g., rewards and teacher feedback), affect students while they are learning (Schunk, 1989). From these factors, students derive cues signaling how well they are learning, which they use to assess their efficacy for further learning. Motivation is enhanced if students perceive they are making progress in learning. In turn, as students work on tasks and become more skillful, they maintain a sense of self-efficacy for performing well (Torkzadeh et al., 1999).

Chowdhury, Endres, and Lanis (2002) noted that in courses that involve major team projects, a large proportion of students are not confident with specific aspects of

team environments. In team situations where a semester-long approach is taken, but with changing team projects throughout the semester, transferring members with low self-efficacy from low-performing teams to high-performing teams and vice versa may improve individual performances and the overall performance of the class. Exposing members with low self-efficacy to successful experiences and to members with high self-efficacy can improve their self-efficacy (Chowdhury et al., 2002). Numerous organizational behavior studies have investigated the role of self-efficacy in the team environment (Phillips, 2001; Cohen & Bailey, 1997; Hyatt & Ruddy, 1996). Many of them have focused on improving self-efficacy in order to improve both individual and organizational performance. Literature on effective team composition examined mainly demographic characteristics and their influences on team effectiveness (Campion et al., 1993; Bantel & Jackson, 1989; Wanous & Youtz, 1986). General findings in team research suggests that for solving complex, non-routine problems, teams are more effective when they are composed of people with a variety of skills, knowledge, ability, and perspectives (Gladstein, 1984; Hackman, 1987; Pearce & Ravlin, 1987; Wanous & Youtz, 1986). Chowdhury et al. (2002) suggested that individual behavior variables, such as self-efficacy and satisfaction, are important to find the right mix of people in a team. The findings suggest a significant positive relationship between team members' self-efficacy and their satisfaction with the team environment (Chowdhury et al., 2002).

The goal of meetings is to develop the ability and desire to address and discuss any issues directly, no matter how charged it might be. Because of this goal, teamwork and meetings go hand in hand when addressing issues related to organizational culture. In group process curriculum, participants learn how to use group facilitation skills for

achieving quality consensus solutions to controversial issues (Glaser et al., 1994). The study by Glaser et al. (1994) found that meetings created an environment where students were more skillfully led and participants became more skillful. Bandura (1988a) states, "in perfecting their skills, people need informative feedback on how they are doing." This would suggest that when meetings are conducted correctly and efficiently they have the potential to have a positive impact on the participants (Mason, 2007).

Information flow examines whether students get enough information to be efficient and productive, know why changes are made and know what is happening in fields outside of their own (Glaser & Glaser, 2006). The purpose of information flow is to have students model the actions making up skill sets being taught. In studying the factors affecting computer self-efficacy, information flow is necessary because it enables students to have a clear understanding of how and why a particular skill works.

Involvement has also been found to be a necessary factor in increasing computer self-efficacy (Glaser et al., 1987). Since involvement requires input and participation in decision-making processes, instructors and administrators in university settings are under increased pressure to make student involvement a priority in classroom activities.

Supervision offers instructors the opportunity to contribute to the performance and self-esteem of their students and potentially impact students' computer self-efficacy. Instructors have an important impact on the morale and productivity of a university. Though they are often selected based on qualification and talents, an instructor's success largely depends on their interpersonal skills to guide and motivate their students (Bandura, 1988a). For these and other reasons, supervision, teamwork, climate and

moral, involvement and information flow have all been chosen as factors that could have significant impacts on students' computer self-efficacy in universities.

MODERATING FACTORS

Other factors such as emotional responses, stress, age, computer experience, gender and anxiety of the individual performing the behavior (Table 2.1), have also been found to affect computer self-efficacy (Bandura, 1977). Research suggests that individuals with more computer experience have higher levels of computer self-efficacy (Bandura, 1986); however it is important to note that several authors have found evidence to the contrary. Karsten and Roth (1998), for example, examined the relationship between computer experience, computer self-efficacy, and performance in Information Systems (IS) courses and found that computer experience had no significant impact on computer self-efficacy beliefs. Bassam (2003) also examined the relationship between computer self-efficacy and computer experiences and found that experiences with programming and computer graphics applications have the strongest effects on computer self-efficacy beliefs. From a theoretical perspective, the findings of Bassam (2003) provide support for Bandura's (1986) proposition that prior experience, especially with respect to difficult and unfamiliar tasks, is a significant determinant of self-efficacy beliefs.

Amabile (1988) indicated that having the freedom to decide what to do and how to do one's work enhances the capability for creative behavior. Conceptualized as self determination, user autonomy is positively related to innovation (Spreitzer, 1995; Spreitzer, De Janasz, & Quinn, 1999). If users have autonomy to determine how the computer is used in their work, they are more likely to perceive their achievements as being caused by their own actions (Deng et al., 2004). Attribution of behavior to personal

causality can enhance self-efficacy (Bandura 1977; Schunk & Gunn, 1986; Silver et al., 1995). When users have more of a chance to experiment and learn, they will develop more confidence in their ability to use software applications effectively. Deng et al. (2004) argues that user autonomy, collegial support, and information technology learning capabilities are important determinants of computer self-efficacy in the ongoing use context. According to Deng et al. (2004), user autonomy does influence computer self-efficacy beliefs and it enhances an individual's ability to experiment with new or modified ways of using the computer. The greater the user autonomy is in deciding how to use the computer in work, the higher the perception of computer self-efficacy (Deng et al., 2004).

Other research studies indicate that negative user attitudes towards computers may be caused by computer anxiety (Torkzadeh et al., 1999). Igbaria and Iivari (1995) found that computer anxiety mediates the relationship between computer self-efficacy and hours of use. Computer anxiety is also an important predictor of computer achievement (Marcoulides, 1989). Byrnes and Johnson (1981) indicated that negative emotional reactions toward computers influence the degree to which computers can effectively be utilized. Bandura (1977) found that individuals experience anxiety in attempting to perform behaviors they do not feel competent to perform.

Gender has been explored as a significant mediating factor affecting computer self-efficacy. The research on gender and computing has often reported that males have more experience and use of computers (Brosnan & Lee, 1998; Balka & Smith, 2000). For example, Chua, Chen, and Wong (1999) and Coffin and Mackintyre (2000) in their meta-analyses on the relationships between computer anxiety, computer attitudes, computer

self-efficacy, and computer experience state that most findings usually reinforce the gender effects and suggest that greater levels of computer experience are associated with lower computer anxiety and more positive computer attitudes. Galpin et al. (2003) found that the self-efficacy scores for female students tend to be lower than males. It was reported that there was a tendency of women to be less positive about their computing abilities and that there were significant gender difference in perceptions of computer science (Galpin et al., 2003). The majority of female students surveyed predicted that they would receive a D grade; none of them predicted that they would make an A, and most of them received a C. The males had higher predictions but their actual grades were more widely distributed (Galpin et al., 2003). No male students predicted failure but a number received a failing mark (Galpin et al., 2003). Torkzadeh and Van Dyke (2001) found that men generally scored higher on computer self-efficacy than women. Several studies have investigated female students' choice of courses and careers, and self-efficacy has turned out to be a critical predictor. Female students have significantly lower self-efficacy than male students regarding math-related and traditionally male-dominated subjects, including computer science (Hackett, 1985). However, controlling for computer experience, men and women had similar interest toward computers (Badagliacco, 1990). Loyd, Loyd, and Gressard (1987) reported that female students had less computer anxiety than male students, and female students liked working with computers more than male students. Rosen, Sears, and Weil (1987) on the other hand, found that gender was not related to computer anxiety, but was significantly related to computer attitudes, with women having more negative attitudes.

The research on age as a moderating factor on computer self-efficacy has produced some interesting results with regards to older individuals and their computer usage. Marquie et al. (2002, p. 273) stated "the integration of elderly people in our modern societies depends increasingly on their ability to master new technologies, especially computer technologies." Over the past twenty years, several researchers have published articles reporting a negative relationship between age and computer performance (Czaja et al., 1989; Dyck & Smither, 1996; Elias et al., 1987; Gist et al., 1988; Gomez et al., 1986; Hartley et al., 1983). Some researchers suggest age merely parallels experience. In other words, less exposure to computers for older individuals and, in turn, less experience, explains lower computer performance for older individuals (Ansley & Erber, 1988; Czaja & Sharit, 1993). Kelley and Charness (1995) postulated that age affects computer performance and examined age-related abilities, experiences, and attitudes as potential explanatory variables. Fernández-Ballesteros et al. (2002) noted age enhances self-efficacy with younger participants having higher efficacy than older ones. Saleh (2006) also noted in a similar study that younger respondents (under the age of 35) were more likely to have high computer self-efficacy than those over the age of 46.

It is obvious that researchers have varying views on the factors that have an impact on computer self-efficacy and the more research that is conducted on the subject, the greater the likelihood of finding conclusive evidence and determining the factors that affect computer self-efficacy. A greater understanding of these factors can be useful in a variety of settings ranging from academic, business, industrial and the public sector.

Table 2.1 Computer self-efficacy factors explored by prior researchers. The 'x' indicates that the author did explore that factor in his/her research on computer self-efficacy.

FACTORS	Mason (2007)	Deng et al. (2004)	Gist & Mitchel (1992)	Maracus et al. (1998)	Fernández-Ballesteros et al. (2002)	Locke et al. (1984)	Torkzaden et al. (1999)	Compeau & Higgins (1995)	Bandura (1986)	Glaser & Zamanou (1987)
Information Flow	×		×	×						×
Climate and Moral	×		×	×		×	×			×
Supervision	×					×			×	×
Teamwork	×			×		×			×	×
Involvement	×			×						×
Meetings	×									×
Experience								×	×	
User Autonomy		×							×	
Age					×					
Gender					×					
Perceptions of Computer Science		×			×		×		×	
Collegial Support		×						×		
Motivation		×						×		

CHAPTER THREE: RESEARCH MODEL AND HYPOTHESES

This chapter presents the research model adopted for this study as well as the materials and methods used for data collection and analysis.

CONCEPTUAL FRAMEWORK

The shared perceptions and beliefs that make up a university's academic culture are fostered and cultivated by communications and interactions among students and faculty inside and outside of the university. These perceptions and beliefs then affect and can be influenced by people's behaviors on things like how to solve problems, how to approach tasks and how to communicate, which in turn affect performance and satisfaction (Bates, Holton, & Seyler, 1997). Based on these beliefs, the following conceptual framework was envisioned for this study (Figure 3.1). The aim of this conceptual framework is to outline possible courses of action or to present a preferred approach. The conceptual framework provides a context for the research model of this study, namely the effects of various factors on students' computer self-efficacy.

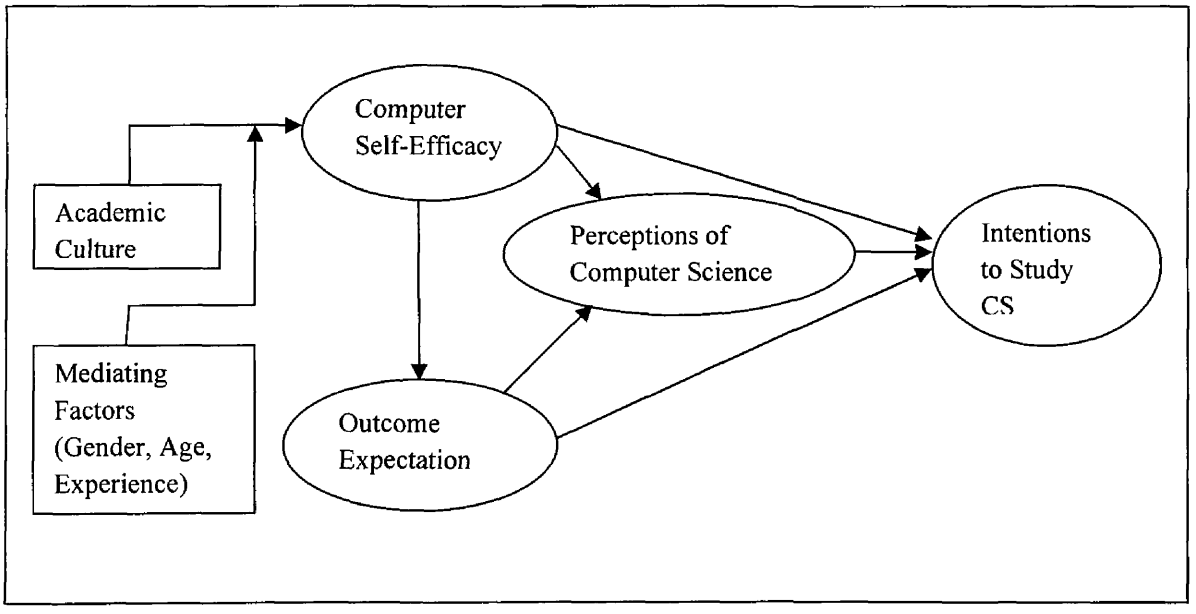


Figure 3.1 Conceptual framework for this study.

RESEARCH MODEL

The research model used for this study is presented in Figure 3.2. Our research model was adopted from a similar study conducted by Sheng, Pearson, and Crosby (2003) which focused on organizational culture and employee's computer self-efficacy. Their study examined the six factors believed to have an impact on computer self-efficacy in the workplace (teamwork, climate and morale, information flow, involvement, supervision, and meetings). This study assumed that the same model would explain the effects of academic culture on students' computer self-efficacy (Figure 3.2).

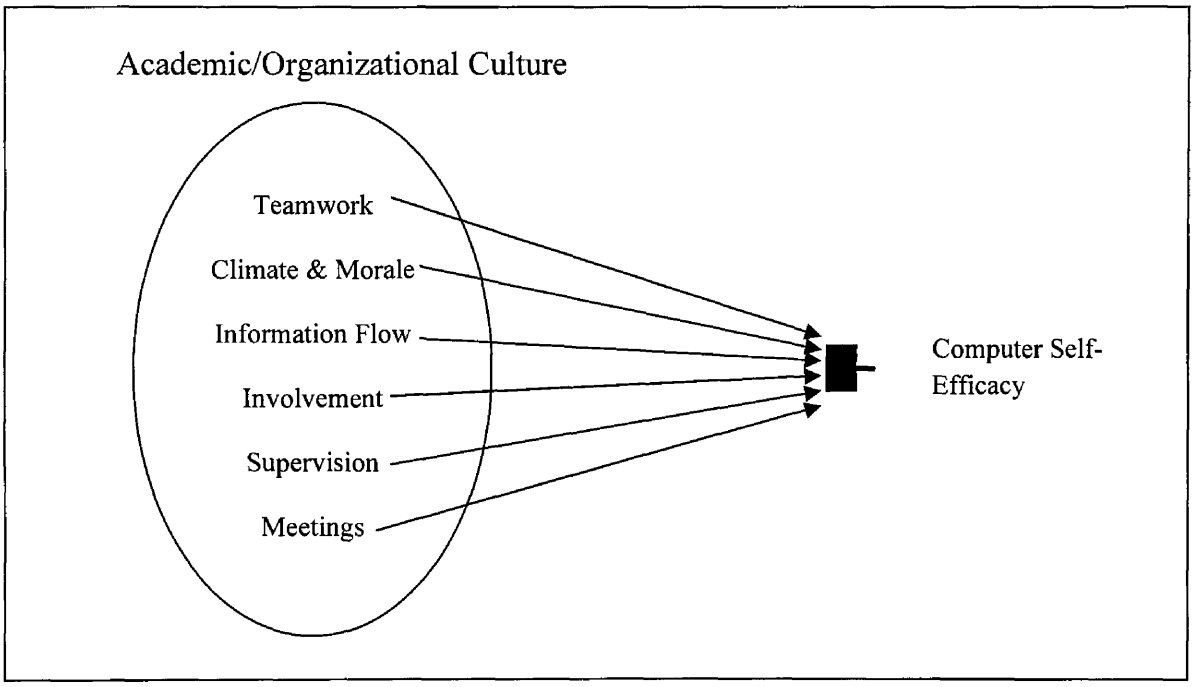


Figure 3.2 Research model adopted for this study.

The component definitions represented in the research model are given in Table 3.1. and were derived from a study conducted by Glaser and Zamanou (1987) which measured these same factors and their effects on computer self-efficacy. The component definitions used for this study were re-worded in a context that was more applicable to

student academic culture in a university setting. The term "employee" was replaced with the word "student," "workplace" was replaced with "classroom," and "organization" was replaced with "university."

Table 3.1 Definitions for the factors outlined in the research model.

Factor	Definition
Teamwork	The reported coordination of effort, interpersonal cooperation and/or antagonism, resentment, power struggles within class.
Climate & Morale	The reported feelings about university conditions, motivation, general atmosphere, classroom character.
Information Flow	The links, channels, contact, flow of communication to pertinent people or groups in the classroom; feelings of isolation or being out of touch.
Involvement	The reported input and participation in decision making; respondents feel that their thoughts and ideas count and are encouraged by instructors to offer opinions and suggestion.
Supervision	The reported information by the students on their instructors; the extent to which they are given positive and negative feedback on work performance; the extent to which assignment expectations are clear.
Meetings	The reported information on whether meetings occur and how productive they are.
Computer Self-Efficacy	A judgment of one's capability to use a computer in the accomplishment of a task.

Studies of change in colleges and universities often consider faculty support (covering information flow, involvement, climate and morale), peer interaction (corresponding to teamwork), classroom setting and supervision as key influences on the success of academic reform efforts. It has been shown that organizational culture can have a positive effect on competitive advantage, increased productivity and performance (Yeung, Brockbank, & Ulrich, 1991). On an individual's level, Zamanou and Glaser (1994) found organizational culture could affect an individual's participation and involvement. The Organizational Culture Survey (OCS) developed by Glaser et al. (1987) was adopted in this study for conceptualizing these components of organizational

culture. The OCS consisted of six components grounded in both management and communication research: teamwork, climate and morale, supervision, involvement, information flow and meetings. The Organizational Culture Survey questions adopted for our study were reworded to be more applicable to the university setting (Table 3.5). The term "people" was replaced with "students," "organization" was replaced by "university," "supervisor" was replaced with "instructor," and "job" was replaced by "class."

HYPOTHESES

Based on the factors outlined in the organizational culture elements in Figure 3.1, six hypotheses were formed. The hypotheses listed in Table 3.2 were formed concerning the relationships between the organizational culture elements and computer self-efficacy.

Table 3.2 Hypotheses that form the research model.

Hypothesis	Statements
Hypothesis 1:	Teamwork is positively related to students' computer self-efficacy.
Hypothesis 2:	Organizational climate and students' morale are positively related to students' computer self-efficacy.
Hypothesis 3:	Information flow is positively related to students' computer self-efficacy.
Hypothesis 4:	Involvement is positively related to students' computer self-efficacy.
Hypothesis 5:	Supervision is positively related to students' computer self-efficacy.
Hypothesis 6:	The occurrence and productivity of meetings is positively related to students' computer self-efficacy.

Our hypotheses were as follows:

HYPOTHESIS ONE. Within the organizational culture scale, teamwork is defined as "reported coordination of effort, interpersonal cooperation; people talk directly and candidly about problems they have with each other" (Glaser & Zamanou, 1987). Teamwork encourages cooperation and coordination. When students face difficulties in

the classroom, they usually try harder to overcome these obstacles by actively seeking assistance or advice from their instructor or classmates. The help and the guidance that they receive from others help them to perform better in class and contribute to their self-efficacy (Bandura, 1977; Henry & Stone, 1999; Locke et al., 1984). Within a positive teamwork environment, members talk directly and work together; the close working relationship facilitates the modeling and persuasion effect of computer self-efficacy. Within a supportive teamwork environment, members are willing to help each other; they do not feel alone and isolated when performing tasks on computers. They can learn computer skills from each other and get trained conveniently; this would improve their computer self-efficacy (Locke et al., 1984). This leads to the proposal of the following hypothesis: *Teamwork is positively related to a student's computer self-efficacy.*

HYPOTHESIS TWO. Climate and morale is defined as "reported feelings about work conditions, motivation, general atmosphere, organizational character" (Glaser & Zamanou, 1987). People having higher morale are usually more self-motivated. These individuals tend to be more motivated to overcome obstacles (Gardner & Rozell, 2000; Gist & Mitchell, 1992), therefore, the following hypothesis is proposed: *Organizational climate and students' morale are positively related to a student's computer self-efficacy.*

HYPOTHESIS THREE. Supervision is defined as "reported information by the employees on their immediate supervisor; the extent to which they are given positive and negative feedback on work performance; the extent to which job expectations are clear" (Glaser & Zamanou, 1987). The evaluation of a supervisor is one kind of feedback. Positive supervision could boost people's confidence, encourage employees to use the computer even if they have only limited experience with the computer, and would

encourage them to be willing to switch to computer-based work or a new kind of software package. This would improve the employees' computer self-efficacy as past performance can contribute to one's self-efficacy (Bandura, 1977; Henry & Stone, 1999; Locke et al., 1984). These arguments suggest the following: *Supervision is positively related to a student's computer self-efficacy.*

HYPOTHESIS FOUR. Information flow is defined as "links, channels, contact, and flow of communication to pertinent people or groups in the organization" (Glaser & Zamanou, 1987). Good information flow could help propagate information concerning the use of computers by peers. Under good information flow, the use of computers and new ways of using the computer would be easily distributed, which would help promote a student's computer self-efficacy. Good information flow also promotes a feedback system. Administrators could use feedback as a resource for performance monitoring and adjust policies and procedures accordingly, to achieve better outcomes which in turn would improve students' computer self-efficacy. As mentioned previously, computer self-efficacy is a dynamic judgment that changes with newly acquired information. Students in an environment with good information flow could construct and orchestrate adaptive performances to meet changing situational demands. The adoption of new beliefs and their capability to perform a task could be facilitated by the availability of accurate information about the causes of good performance, as well as information about the specific tasks that the students are undertaking (Gist & Mitchell, 1992). This suggests the following hypothesis: *Information flow is positively related to a student's computer self-efficacy.*

HYPOTHESIS FIVE. Involvement is defined as "reported input and participation in decision-making" (Glaser & Zamanou, 1987). Students feel that their thoughts and ideas count and are encouraged by instructors to offer opinions and suggestions that could improve their computer self-efficacy. Students involved in decision-making processes are usually well informed. During decision making, students would become aware of the pros and cons of the computer technology and software application that will be brought in. This, to some extent, enhances involvement. As the suggestions, presentations and debates are part of the education, persuasion, and feedback process for students involved in the decision making processes, these could all positively contribute to students' computer self-efficacy. Instructors tend to listen to students who are knowledgeable in their fields, do things right, and have superior past performance. These students' ideas and thoughts are usually solicited, assessed, and possibly adopted by universities. Based on these typical scenarios, involvement in the decision-making process of a class or university can be viewed as positive feedback from students, which would improve their computer self-efficacy. Thus, the following hypothesis is proposed: *Involvement is positively related to a student's computer self-efficacy.*

HYPOTHESIS SIX. Meetings are defined as "reported information on whether meetings occur and how productive they are" (Glaser & Zamanou, 1987). Periodical meetings can be regarded as a way to enhance information flow and involvement, which all impact self-efficacy. Various opinions and suggestions from students and instructors are exchanged and discussed in meetings. Students can obtain a variety of information, either educational or non-educational, and feelings of involvement and teamwork through meetings, which could in turn influence their self-efficacy. This leads to the following

hypothesis: *The occurrence and productivity of meetings is positively related to a student's computer self-efficacy.*

INSTRUMENT

The survey instrument used for the study comprised of ninety-one items and was divided into four sections: Demographics, Computer Self-efficacy, Student Academic Culture, and Perceptions of Computer Science. There were fourteen demographics questions concerning gender, education, intent to study Computer Science, expected grade and computer experience (Table 3.3). The demographic questions were adopted from a study by Sheng et al. (2004) which examined the impact organizational culture has on employees' computer self-efficacy.

Table 3.3 Demographic items of the survey instrument.

RESPONSES ARE GIVEN EITHER BY SHORT ANSWER, FILL IN THE BLANKS, OR BY MARKING THE CHOICES FOR YOUR SELECTED ANSWERS. MARK THE BOX OR CIRCLE THE NUMBER CORRESPONDING TO YOUR CHOICE
(1) What is your age? _____
(2) What is your gender? Female Male
(3) Please mark all that apply. full-time student part-time student 25 years of age or older married or with a domestic partner have children working full time working part-time
(4) How many years and months have you attended college? Years _____ Months _____
(5) What is your academic classification? (Please mark) Freshman Sophomore Junior Senior
(6) Of the listed education certificates, please select your current level of achievement? High school diploma Some college hours of credit College degree College degree and some graduate semester hours of credit Masters degree and continuing education hours of credit
(7) What field of study are you majoring in? _____
(8) Do you intent to take computer studies as a subject choice: yes no maybe
PRIOR EXPERINCE
(9) Approximately how often do you use computers? every day three times a week once a week once a month less than once a month
(10) How many hours per week do you spend: • Using the internet _____ • Playing computer games _____ • Using productivity software (e.g. word, spreadsheets etc) _____
(11) Had you had computer programming experience before entering IS2241? Yes No
(12) Had you used productivity software before entering IS2241? Yes No
(13) Do you have access to a computer when you are not at University? Yes No
(14) What final grade do you expect for IS2241? _____

For the computer self-efficacy measurement, a modified version of the scale and questions developed by Compeau and Higgins (1995) were used. There were ten questions measuring computer self-efficacy (Table 3.4) and analysis was based on a *yes* or *no* ability to complete a job using a software package under a given condition. For conditions answered *yes,* a confidence rating was petitioned on a scale of 1 to 10, where 1 indicates *not at all confident*, 5 indicates *moderately confident*, and 10 indicates *totally confident*. The self-efficacy score was calculated by summing the confidence ratings for

the *yes* responses. The *no* responses were assigned a zero value, thus the possible scores ranged from 0 (all *no's*) to 10 (maximum confidence rating).

Table 3.4 Computer self-efficacy survey items.

I COULD COMPLETE THE ASSIGNMENT USING THE SOFTWARE PACKAGE...
(1) ...if there was no one around to tell me what to do as I go.
(2) ...if I had never used a package like it before.
(3) ...if I had only the software manuals for reference.
(4) ...if I had seen someone else using it before trying it myself.
(5) ...if I could call someone for help if I got stuck.
(6) ...if someone else had helped me get started.
(7) ...if I had a lot of time to complete the job for which the software was provided.
(8) ...if I had just the built-in help facility for assistance.
(9) ...if someone showed me how to do it first.
(10) ...if I had used similar packages before this one to do the type of assignment.

The student academic culture survey contained thirty-one questions adopted from the Organization Culture survey by Glaser et al (1983). These questions were re-worded in a format applicable to a university setting and measured on a five-point Likert scale with a 1 standing for *to a very little extent* and 5 representing *to a very great extent* (Table 3.5).

Table 3.5 The student academic culture survey.

Teamwork (Internal consistency Cronbach's alpha coefficient = 0.785)	
(T1)	Students I work with are direct and honest with each other.
(T2)	Students I work with accept criticism without becoming defensive.
(T3)	Students I work with function as a team.
(T4)	Students I work with constructively confront problems.
(T5)	Students I work with are good listeners.
(T6)	Students and instructors have a productive working relationship.
Climate & Morale (Internal consistency Cronbach's alpha coefficient = 0.878)	
(CM1)	This university motivates me to put out my best efforts.
(CM2)	This university respects its students.
(CM3)	This university treats people in a consistent and fair manner.
(CM4)	There is an atmosphere of trust in this university.
(CM5)	This university motivates people to be efficient and productive.
Information Flow (Internal consistency Cronbach's alpha coefficient = 0.658)	
(IF1)	I get enough information to understand the big picture for the course.
(IF2)	When changes are made to the course outline, the reasons why are made clear.
(IF3)	I know about other classes outside of my own.
(IF4)	I get the information I need to do my coursework well.
Involvement (Internal consistency Cronbach's alpha coefficient = 0.777)	
(I1)	I have a say in decisions that affect my class work.
(I2)	I am asked to make suggestions for improving my coursework.
(I3)	This university values the ideas of students at every level.
(I4)	My opinions count in this university.
Supervision (Internal consistency Cronbach's alpha coefficient = 0.815)	
(S1)	Course requirements are made clear by my instructor.
(S2)	When I do a good job my supervisor tells me.
(S3)	My instructor takes criticism well.
(S4)	My instructor delegates responsibility.
(S5)	My instructor gives me criticism in a positive manner.
(S6)	My instructor is a good listener.
(S7)	My instructor tells me how I'm doing.
Meetings (Internal consistency Cronbach's alpha coefficient = 0.844)	
(M1)	Decisions made in class get put into action.
(M2)	Everyone takes part in discussions in class.
(M3)	Our discussions in class stay on track.
(M4)	Time in class is time well spent.
(M5)	Class discussions tap the creative potential of the people present.

The Perceptions of Computer Science survey by Galpin et al. (2003) contained thirty-six questions focusing on gender and experience of perceptions of Computer Science using a six point scale where 1 representing *strong disagreement* and 6 representing *strong agreement* with each particular statement. Students were asked to specify their gender assumptions, perceived gender skills and computer usage. Some of

these statements asked specific questions about general computer self-efficacy and hence are not included here (see Appendix A). Of the thirty-six questions, twelve measured perceptions of Computer Science as male oriented.

Table 3.6 Perceptions of Computer Science as male oriented.

1) I am confident that women can learn computer science.
2) I would expect the top computer science student to be a boy.
3) Computer science is not an appropriate field for women.
4) Most of the people I know that like computers are male.
5) Girls enjoy reading computer magazines.
6) Boys like computer games more than girls do.
7) I would expect most people who do computer science are boys.
8) Men don't make better scientists than women do.
9) Girls are as good with computers as boys are.
10) Most people who work with computers are men.
11) There are jobs in computer science suitable for women.
12) Most girls are interested in computers.

SAMPLE

The target population for this study was Troy University students enrolled in an introductory Information Systems course. IS2241 Computer Concepts and Applications is a three credit course that provides an interdisciplinary introduction to microcomputer literacy, word processing, spreadsheets, database, business graphics, and the internet.

The survey was administered at the end of term during the last session of the class by the instructor teaching the class. Data was collected between Spring 2008 and Spring 2009 in nine sections of the course. In the preliminary instructions of the survey instrument, the subjects who participated were guaranteed anonymity and confidentiality of their responses. Three hundred and ten students participated in the study, which was large enough to yield an adequate model fit for a test (Hu & Bentler, 1995).

DATA ANALYSIS

MEASUREMENT MODEL. The American Psychological Association defines the reliability of a measurement as the degree to which the test scores are free from errors of measurement (Pedhazur & Schmelkin, 1991). Hence, reliability indicates the accuracy or precision of a measurement procedure (Thorndike, 2005). Standard errors of measurement and reliability coefficients are two ways of expressing reliability (Thorndike, 2005). Standard error is the standard deviation of errors in a data set (Ross & Lowther, 2003). Lower standard errors of measurement indicate a higher degree of reliability. Reliability coefficients indicate the degree of correlation between two applications of same measure. Higher reliability coefficients indicate higher reliability. Usually, an alpha of 0.50 - 0.70 or higher is judged as an acceptable level of reliability (Pedhazur & Schmelkin, 1991). However, some researchers would suggest that a reliability coefficient of 0.90 for knowledge-based instruments and a reliability coefficient of 0.70 for attitude scales is considered acceptable (Ross & Lowther, 2003).

The internal consistency approach is one of the common reliability measures. Since different split methods will obtain different reliability estimates, one of the solutions is to assume that each item in a test can be considered as a one-item test, and then calculate the tau-equivalency, such as Cronbach's alpha, as the reliability coefficient (Ross & Lowther, 2003; Thorndike, 2005). When calculating Cronbach's alpha, each individual item error variance is considered.

Cronbach's alpha assumes that the items in the instrument are tau-equivalent; that is they differ from each other by no more than a constant. Therefore, coefficient alpha will underestimate the reliability of a measure when its items are not at least essentially

tau-equivalent. Hence, the Cronbach's alpha is a lower bound estimate of reliability (Pedhazur & Schmelkin, 1991).

Upon assessment of the measurement model, the next step is to inspect the convergent validity of the constructs. Construct validity refers to the degree to which inferences can legitimately be made from the operational measures in a study to the theoretical constructs on which those operational measures were based (Trochim, 2006). In this study, the confirmatory factor analysis (CFA) approach for testing reliability of the scale was attempted. Testing the measurement model through confirmatory factor analysis is a desirable validation stage before using Analysis of Moments Structures (AMOS) to model the causal relations among latent variables. Confirmatory Factor Analysis (CFA) allows the researcher to examine factor loadings of indicator variables to determine if they load on the latent variables (factors) predicted by the researcher's model. This can provide a more detailed insight into the measurement model than the use of single coefficient goodness-of-fit measures. Confirmatory factor analysis is done in AMOS by removing all connecting latent variables from the model, adding paths representing covariance between every pair of latent variables and leaving in the paths from each latent variable to its indicator variables as well as leaving in the paths from error and disturbance terms to their respective variables. Confirmatory factor analysis is based on the correlation matrix, means, and standard deviations of each item. These factors loadings determine what each factor is measuring (for example, T3 measures Teamwork) and which factors will be used in the structural model.

STRUCTURAL MODEL. AMOS was chosen for testing the hypotheses of the research model using the Structural Equation Modeling (SEM) approach. SEM is a

statistical methodology that takes a confirmatory (i.e., hypothesis-testing) approach to the analysis of a structural theory bearing on some phenomenon. SEM represents casual processes that generate observation on multiple variables (Bentler, 1988). The AMOS in this study was executed using AMOS-Graphics v4.0. AMOS was chosen for this study because of its capability to specify, estimate, assess, and present models in an intuitive path diagram showing hypothesized relationships among variables. AMOS enables the researcher to test and confirm the validity of hypotheses because of its ability to realistically reflect complex relationships and use observed variables such as surveys data and latent variables to predict other numeric variables (Arbuckle, 2006). Typically, a researcher postulates a statistical model based on his or her knowledge on empirical research in the area of study.

Structural equation modeling includes three major components: observed variables (or called indicators, manifest variables), latent variables (or called constructs, concepts), and path relationships (including one-way, two-way, and correlation paths). A structural model represents the hypothesized structure linking the observed variables (T3, Figure 3.3) to the latent variables (Teamwork) and linking particular latent variables to one another.

Latent variables are usually represented in a circle shape. A latent variable is a variable which cannot be observed directly, such as the self-efficacy. Because latent variables cannot be observed directly, they cannot be measured directly. The researcher therefore has to define the latent variables of interest in terms of behavior believed to represent it. There are two kinds of latent variables. An exogenous variable (Teamwork, Information Flow, Meetings, Involvement, Supervision, Climate and Morale in Figure

3.3) is a construct which can explain other latent variables, while an endogenous variable (Computer Self-Efficacy, Figure 3.3) is a construct which can be explained by other exogenous variables. The endogenous variables can be considered as the equivalent of dependent variables, whereas the exogenous variables are equivalent of independent variables (Hair et al., 2006; Meyers et al., 2006).

Observed variables are measured to represent constructs (latent variables), for example, IF1, IF2, IF3 and IF4 are the observed variables that measure the Information Flow construct. Observation may include self-report responses, scores on an achievement test, and coded responses to interview questions. These measured scores are termed observed variables. Observed variables (or indicators variables) are represented in a square shape. Within the context of SEM methodology, observed variables serve as indicators of the underlying construct which they are presumed to represent (Byrne, 2009).

The relationship between the latent variable and the observed variable can be explained by the parameter estimation between that latent and observed variable. In the structural model outlined in Figure 3.3, the researcher assumes that Climate and Morale, Teamwork, Supervision, Information Flow, Involvement and Meetings have a direct influence on Computer Self-Efficacy.

Once the model is specified, the researcher then tests its plausibility based on sample data that comprise all observed variables in the model (Byrne, 2009). The primary task in this model-testing procedure is to determine the goodness-of-fit between the hypothesized model and the sample data (Byrne, 2009). In AMOS, numerous measures of model-fit are computed, including Bentler-Bonett (1980) normed and non-normed fit

indices, the Bollen (1986, 1989) indices, root mean squares residual (RMSR), goodness-of-fit and adjusted goodness-of-fit indices (Joreskog & Sorbom, 1989; Tanaka & Huba, 1985) and Hoelters (1983) critical N. To determine the model fit for this study, RMSR, goodness-of-fit and adjusted goodness-of-fit indices were examined. The RMSR is a measure of the average variance unaccounted by the mode by measuring the average of the residual correlation when the predicted correlations from the model are subtracted from the observed correlations (Byrne, 2009). The goodness-of-fit of a model describes how well it fits a set of observations (Taylor, 1997). Measures of goodness-of-fit typically summarize the discrepancy between observed values and the values expected under the model in question. The adjusted goodness-of-fit (AGFI) is the goodness-of-fit (GFI) adjusted for the degrees of freedom of the model (Byrne, 2009). The AGFI corresponds to the GFI in replacing the total sum of squares by the mean sum of squares. The AGFI and GFI should be between 0 and 1. The data most likely does not fit the model if the AGFI or GFI is negative or much larger than 1. The assessment of the fit of the proposed model is determined from the various indexes. Reasonable model fit is indicated if RMSEA = .05 to 0.08, NFI >= .90, and CFI >= .90. Although Hu and Bentler (1999) suggested a RMSEA value of 0.06 to be indicative of good fit between the hypothesized model and the observed data, they cautioned that when sample size is small, the RMSEA and TLI (non-normed fit index) tend to over-reject true population models.

AMOS allows for a hypothesized model to be tested statistically in a simultaneous analysis of the entire system of variables to determine the extent to which it is consistent with the data (Byrne, 2009). If the goodness-of-fit test is adequate, the model argues for the plausibility of postulated relations among variables; if it is inadequate, the tenability

of such relations is rejected (Byrne, 2009). AMOS will analyze data from several populations at once and will estimate means for exogenous variables, and intercepts in regression equations. The program will also compute full information maximum likelihood in the presence of missing data. AMOS offers choice of four estimation criteria: (a) maximum likelihood, (b) unweighted least squares, (c) generalized least squares, and (d) Browne's asymptotically distribution-free criterion (Arbuckle, 2006). In the case of maximum likelihood, unweighted least squares and generalized least squares AMOS produces the following additional output: (a) A chi-square statistic for a large sample test of the hypothesis that the specified model is correct; (b) Approximation standard errors for the parameter estimates; (c) A critical ratio for each parameter providing a large sample test of the hypothesis that the parameter is zero in the population; (d) A large sample approximation to the variance-covariance matrix of the parameter estimates; (e) An approximate standard of error for the difference between each pair of parameters; and (f) A critical ratio for each pair of parameters, providing a large sample test of the hypothesis that those two parameters are equal in the population (Arbuckle, 2006). The largest number of structural paths in the structural model for this study was six, and the total sample size was three hundred and ten students, which met the sample size requirement recommended. Hoelter (1983) proposed that a sample size in excess of 200 is indicative of a model that adequately represents the sample data. The structural model used for this study is diagrammed in Figure 3.3 showing the latent variables, reflective indicators, and the structural paths. The representation of the model in AMOS is given in Appendix B.

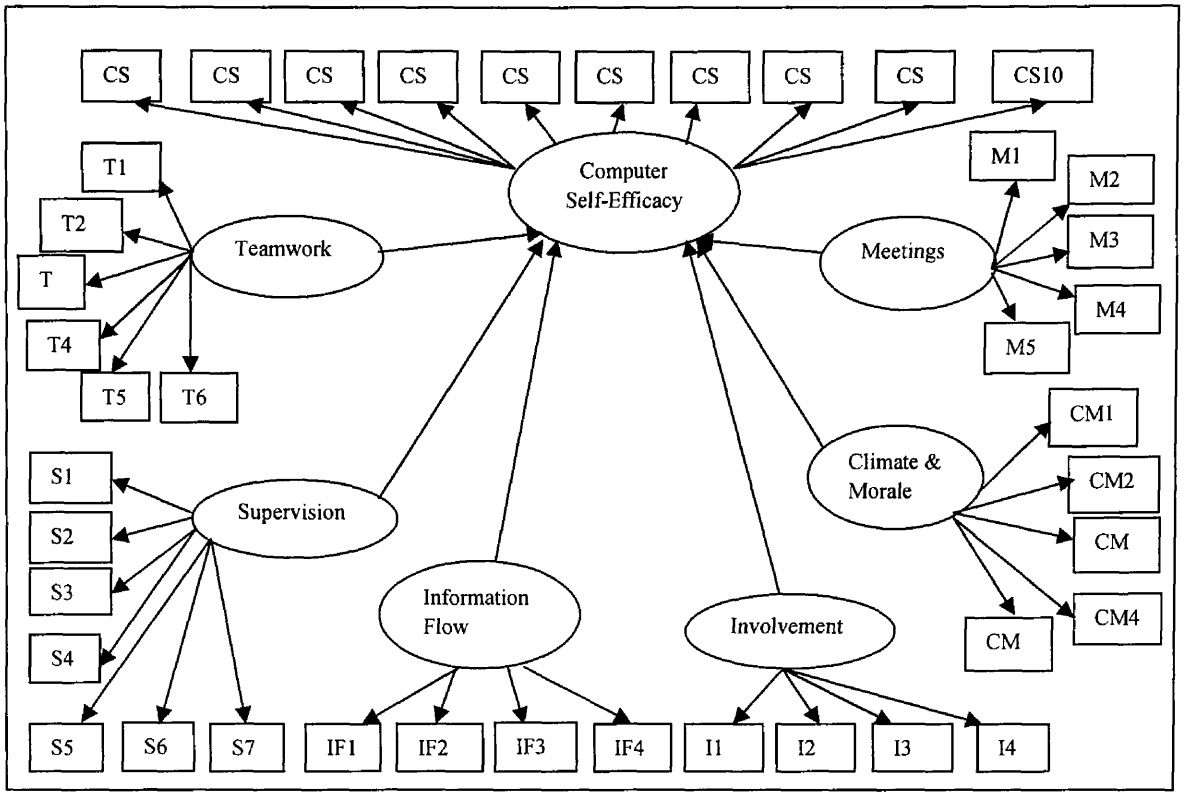


Figure 3.3 Structural model used for this study.

The structural model used for this study was adopted from a similar study conducted by Mason (2007), who studied the impact of organizational culture on employees' computer self-efficacy in the workplace using PSL path modeling. Mason (2007) developed this structural model based on the six components derived from the Organizational Culture Scale by Glaser et al. (1987). In Mason's structural model, each indicator was initialized with equal weights and iteratively scaled to obtain unit variance for the latent variable scores over the number of cases in the sample. Once the procedures for obtaining the weighted estimates of the latent variable indicators were completed, the structural model was deemed ready for assessment.

If the probability (p values) is significantly different to zero (<0.05) it would be suggestive of important relations between observed and latent variables. For this study

we compared two means (males and females) and the null hypothesis was that the two populations had the same mean. The idea is to state a null hypothesis (i.e., that there is no effect), then see if the data obtained allows one to reject it. To determine if the *p* values obtained are statistically significantly we compare the *p* value to the preset threshold value (0.05). If the *p* value is less than the threshold, we reject the null hypothesis and conclude that the difference is statistically significant. If the *p* value is greater than the threshold, the difference is not statistically significant (i.e., there is no effect) and we do not reject the null hypothesis. If a result is statistically significant, there are two possible explanations. The populations are identical, so there is no difference or the populations are different, so the conclusion is correct. There are also two explanations for a result that is not statistically significant. The populations are identical, so there is no difference and any difference observed in the experiment was a coincidence or the populations are different, but the difference was missed due to some combination of small sample size or high variability.

Another indicator of poor model fit is standard errors that are excessively large or small; for example if a standard error approaches zero, the test statistic for its related parameter cannot be defined (Bentler, 1995). Likewise, standard errors that are extremely large indicate parameters that cannot be determined (Jorekog & Sorbom, 1989). For the hypothesis to be rejected, the test statistic has to be >=1.96. A minimum sample size of 100 is needed to detect the interaction effect, and 6 to 8 indicators (observed variables) per construct (latent variable) are needed to obtain structural path estimates within 10 percent of the true effects (Chin et al., 1996). For models with cases higher than 200, the chi square (χ^2) is always statistically significant (Byrne, 2001). Based on these guidelines,

the structural and measurement models were evaluated and the results were documented. These results are analyzed and discussed in the following chapters.

CHAPTER FOUR: RESULTS

The first section of the results gives a description of the demographic makeup of this study. The second segment is the assessment of the measurement model and the third is the evaluation of the structural model. The assessment of the measurement model for reliability and validity and assessing the fit for the proposed model was determined by analyzing the structural model for goodness-of-fit.

DEMOGRAPHICS. Demographic analysis is used to identify the population surveyed. The row labeled *n* gives the number of students in each category. Most of the survey participants were freshmen (52%) and seniors were the least represented (11%). Of the 310 students who participated in the study, 108 were male, and 208 were female. The largest represented major was Business (35%) and the least represented were Undeclared (2%). Two percent of the students responded that they had Engineering majors; however Troy University does not have an Engineering program. Because this course is not required for Computer Science majors, only 2% of the students surveyed majored in this field. The mean age for male participants was 37 with a standard deviation of 12.97, while the mean age for female survey participants was 27 with a standard deviation of 9.27.

Table 4.1 Demographics based on the data collected from survey.

Total Number of Students (n = 310)		
Gender	Number	Percent
Male	108	35%
Female	202	65%
Major		
Computer Science	5	2%
Psychology	53	17%
Business	109	35%
Nursing	35	11%
Marketing	13	4%
Communication Design	5	2%
Criminal Justice	8	3%
Education	8	3%
Radiology	8	3%
English	12	4%
Accounting	22	7%
Engineering	6	2%
Undeclared	6	2%
Classification		
Freshman	162	52%
Sophomores	72	23%
Juniors	42	14%
Senior	34	11%
Age		
>25 years old	200	65%
<= 25 years old	110	35%

MEASUREMENT MODEL ASSESSMENT. Table 4.2 displays the internal consistency reliability for the survey instrument with Cronbach alpha measurements obtained for males, females, and the combined group.

Table 4.2 Internal consistency-reliability scores.

Instrument	Male	Female	Combined
CSE (10 items)	0.926	0.876	0.900
TM (6 items)	0.746	0.785	0.768
CM (5 items)	0.962	0.878	0.929
IF (4 items)	0.850	0.656	0.772
I (4 items)	0.870	0.777	0.835
S (7 items)	0.865	0.815	0.843
M (5 items)	0.929	0.844	0.892

An analysis of the data in Table 4.2 shows that the information flow construct for the female group and perception of computer science constructs for both groups had very

low internal consistency, indicating low reliability. All other constructs appeared to have reliability above the recommended level of acceptable reliability (0.70), indicating the measurement instrument as a whole was reliable.

ASSESSMENT OF THE STRUCTURAL MODEL USING AMOS. The results of the hypothesized model are shown in Figure 4.1 with goodness-of-fit measures listed in Table 4.3.

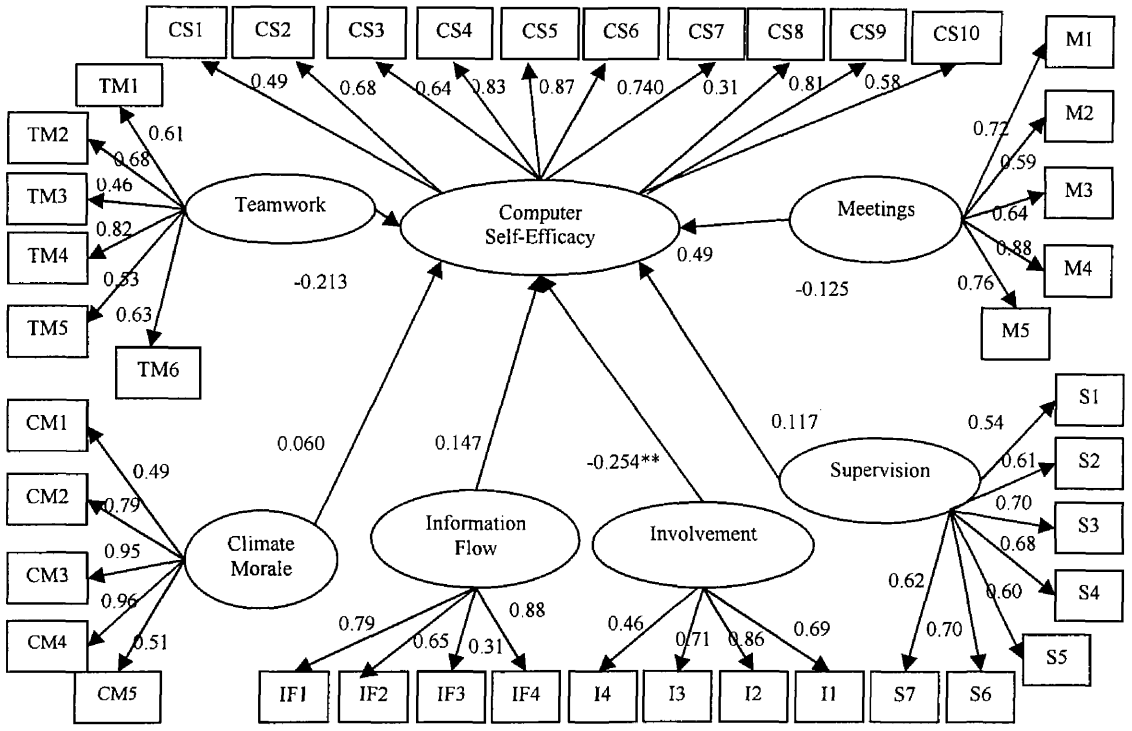


Figure 4.1 Results for the hypothesized model. **is used for significance ($p<0.01$). Error terms have been omitted for clarity.

Table 4.3 Goodness-of-fit measures of the hypothesized model.

Goodness-of-fit measure	Recommended	Entire Sample
Chi Square Test Statistic X^2	varies	7921.381
Goodness-of-fit index (GFI)	>=0.90	0.420
Normed fit index (NFI)	>=0.90	0.280
Comparative fit index (CFI)	>=0.90	0.298
Root mean square error of approximation (RMSEA)	<=0.10	0.214

Based on the GFI, NFI, CFI, and RMSEA values for this model, it was determined that this model did not exhibit a good model fit and therefore the validity of the model could not be firmly established. The results for analyzing the hypothesized model indicate an unacceptable fit between the hypothesized model and the observed data. Criteria for model fitness are based solely on subjective judgment, and therefore cannot be regarded as infallible or correct. Browne and Cudeck (1993) and MacCullum et al. (1996) argued that model fit tests appear to be more realistic than a requirement of exact fit. The Chi-square test is statistically significant ($\chi^2 = 7921.381$, $df = 773$, $p < 0.001$), and the GFI, the CFI, the NFI, and the RMSEA values are 0.420, 0.298, 0.280, and 0.214 respectively, indicating a relatively poor fit.

Pearson correlation coefficients were used to examine if there were linear relationships among latent variables. The correlation coefficients among latent variables reached statistical significance (Table 4.4), indicating that these latent variables were linear correlated. However, among all the coefficients between computer self-efficacy and other latent variables, only two of them reached statistical significance (information flow and involvement), indicating that only these two latent variables had linear relationships with CSE, whereas the other latent variables did not.

Table 4.4 Correlations for latent variables

	1	2	3	4	5	6	7
1. Computer Self- Efficacy	1.000						
2. Teamwork	-.135	1.000					
3. Climate Morale	-.016	.582**	1.000				
4. Information Flow	-.176*	.448**	.458**	1.000			
5. Involvement	-.231**	.530**	.426**	.554**	1.000		
6. Supervision	-.042	.430**	.452**	.598**	.515**	1.000	
7. Meeting	-.104	.483**	.443**	.589**	.593**	.642**	1.000

The coefficient estimates, standard errors (S.E.), p values (p), standardized coefficients and critical ratio (C.R.) estimates are displayed in Table 4.5.

Table 4.5 Regression coefficient estimates for factors affecting computer self-efficacy based on the hypothesized model in Figure 4.1.

FACTORS	Estimate	S.E.	C.R.	p	Standardized Coefficient
Computer Self-Efficacy ←Teamwork	-0.583	0.226	-2.579	0.010**	-0.213
Computer Self-Efficacy ←Climate Morale	0.205	0.243	0.846	0.398	0.060
Computer Self-Efficacy ←Information Flow	0.376	0.198	1.905	0.057	0.147
Computer Self-Efficacy ←Involvement	-0.454	0.151	-3.014	0.003**	-0.254
Computer Self-Efficacy ←Supervision	0.468	0.311	1.503	0.133	0.117
Computer Self-Efficacy ←Meeting	-0.264	0.159	-1.660	0.094	-0.125

Hypothesis 1 proposed that there would be a positive relationship between teamwork and students' computer self-efficacy. The results from testing were contrary to the hypothesis. The standardized coefficient score for teamwork was -0.213 indicating a negative relationship between teamwork and computer self-efficacy. The relationship is statistically significant ($p<0.01$).

Hypothesis 2 proposed that there would be a positive relationship between climate and morale and students' computer self-efficacy. The standard coefficient score for climate and morale suggest a positive relationship but is not significant; therefore, the hypothesis is not confirmed.

Hypothesis 3 proposed that there would be a positive relationship between information flow and students' computer self-efficacy. The standard coefficient score for information flow was 0.147 with the relationship approaching significance.

Hypothesis 4 proposed that there would be a positive relationship between involvement and students' computer self-efficacy. The standard coefficient score for

involvement indicates a negative relationship between involvement and computer self-efficacy and the relationship is significant.

Hypothesis 5 proposed that there would be a positive relationship between supervision and students' computer self-efficacy. The standard coefficient score for supervision supports this relationship between supervision and students' computer self-efficacy; however, the relationship is not significant.

Hypothesis 6 proposed that there would be a positive relationship between meeting and students' computer self-efficacy; however the standard coefficient scores for meeting indicated a negative relationship between meeting and a student's computer self-efficacy. The relationship is not significant.

MODERATING FACTORS. The moderating factors observed in the study were gender, prior programming experience, computer usage, access to computers, age, and prior software experience. Dependant variables such as intent to study Computer Science and expected grades were also observed.

Experience. There was a wide range of computer experience among the participants in this study, with 32% of the students reporting programming experience, 75% reporting productivity software experience and 97% reporting that they have access to a computer outside of the university. Female responses regarding their computer experience and computer access were higher than males (Figure 4.2). Overall, both groups reported very little programming experience. The results reveal that there is no significant difference between male and female programming experience; however, the relationship with software experience and computer access is approaching significance.

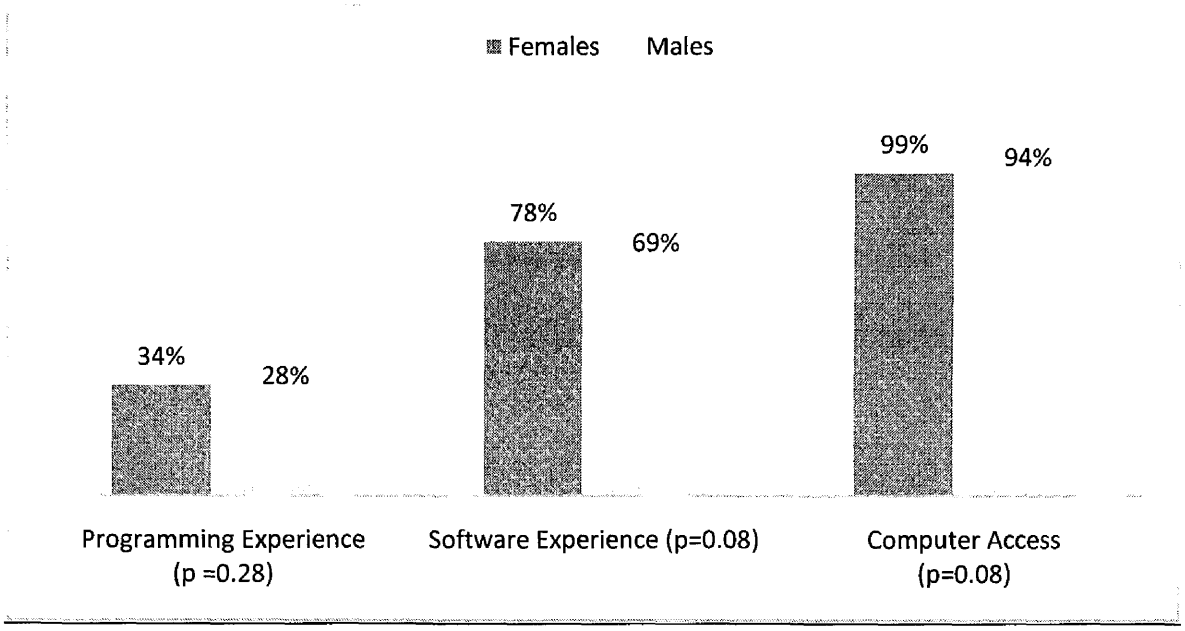


Figure 4.2 Computer access and experience for males and females.

Experience and Self-Efficacy. Analysis of the data on experience and self-efficacy, showed that female students with prior programming experience and male students with computer access had the highest computer self-efficacy scores (Table 4.6). The row labeled *n* gives the number of students in each category. Male students with programming experience indicated the lowest computer self-efficacy scores. The difference in male and female CSE scores with access to computers was statistically significant.

Table 4.6 Experience and computer access.

Gender	Females	Males	Mean	*p*	*t*	Standard Deviation
n	202	108				
Prior programming experience	6.83	6.22	6.53	0.064	1.86	1.925
Software experience	6.84	6.33	6.59	0.067	1.84	1.96
Access to computers outside of school	6.83	6.98	6.91	0.018	2.38	1.955
Mean	6.83	6.51				

Gender and Self-Efficacy. The Cassidy and Eachus (Appendix A.5) and the Compeau and Higgins (Appendix A.3) instruments were used to measure general computer self-efficacy. Figure 4.3 displays the computer self-efficacy scores obtained from the Cassidy and Eachus instrument while Table 4.8 displays the results obtained from the Compeau and Higgins instrument.

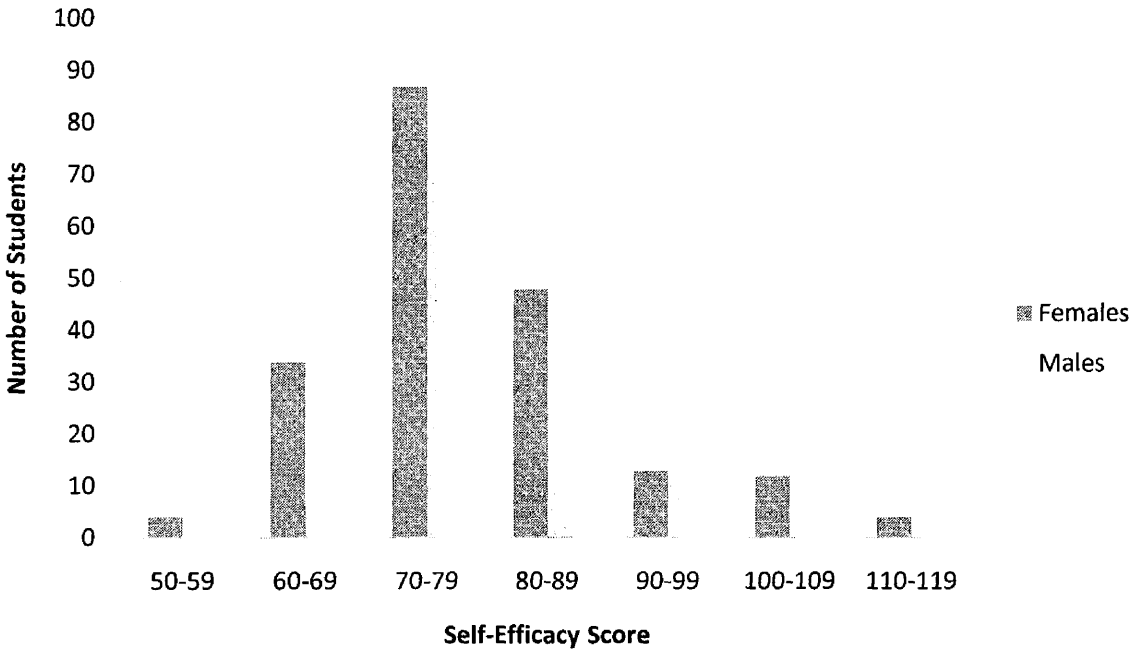


Figure 4.3 Self-efficacy gender comparisons using the Cassidy and Eachus scale.

Using the Cassidy and Eachus computer scale, responses to twenty four questions measuring computer self-efficacy were summed up. A higher score indicated higher computer self-efficacy and the possible scores ranged from 24 to 144. The row labeled *n* gives the number of students in each category. The *t* tests for males and females revealed that there was no significant difference between the mean scores of the two groups (Table 4.7).

Table 4.7 Self-efficacy for males and females using the Cassidy and Eachus scale.

Gender	Female	Male
n	202	108
Mean	29	15
Standard Deviation	25.88	30.39
p=0.3		
t value=0.8		

The data retrieved using the Compeau and Higgins scale on computer self-efficacy confirmed earlier results (Table 4.8) and indicate that females in this study have higher computer self-efficacy scores than males. The row labeled *n* gives the number of students in each category. The mean score for female students is higher than males but this relationship was not significant based on the t-test value (*p* value <0.14 (two-tailed)).

Table 4.8 Computer self-efficacy for males and females using the Compeau and Higgins scale.

Gender	Female	Male
n	202	108
Mean	6.83	5.56
Standard Deviation	0.15	1.62
p=0.14		
t value=1.47		

Age and Self-Efficacy. Females over the age of 25 have the highest computer self-efficacy while males under the age of 25 have the lowest computer self-efficacy. This is particularly startling since female participant responses to grade expectations did not exhibit high levels of confidence in computer self-efficacy.

Expected Grade. The students were asked to predict the final grade they expected for the course. Table 4.9 gives the predicted marks grouped by A (90-

100%), B (80-89%), C (70-79%), D (60-69%), pass marks, and F (less than 60%), a failing mark. The row labeled *n* gives the number of students in each category.

Table 4.9 Grades predicted by males and females.

	Female (*n* =202)			Males(*n*=108)		
	Percentage	*n*	Grade Score	Percentage	*n*	Grade Score
A	16%	33	2.91	56%	60	3.56
B	63%	126		44%	48	
C	17%	35		0%	0	
D	4%	7		0%	0	
p=0.47						

Expected Grade and Gender. The majority of female students assumed they would get a B in the course and only 33 predicted they might get an A. The male students had higher predictions and most predicted they might get an A. Some of the female students predicted they might get a C or D but none of the male students predicted they might receive a C or D in the course. A grade score was calculated based on "A"= 4 and "F"=0. Table 4.9 shows the grade scores for males and females. The grade score for females was lower than the males. The median letter grade for the female group was "B" (grade score = 3), while the median letter grade for the male group was "A" (grade score = 4). T-test indicated that there was not a significant difference between the predicted scores of the two groups (p <0.47).

Perceptions of Computer Science as Male-oriented. The respondents were asked to indicate their level of agreement with 12 statements about the perceptions of Computer Science (CS) as being male oriented. The results are summarized in Table 4.10. The row labeled *n* gives the number of students in each category. The *n* values indicate the number of students with a level of

agreement - 'Agree,' indicated by the number of students who responded with 5 or 6 level of agreement on the scale, level of disagreement - 'Disagree,' indicated by the number of students who responded with 0, 1 or 2 level of agreement on the scale, and the level of neutrality - 'Neutral,' indicated by the number of students who responded with 3 or 4 level of agreement on the scale. Students' agreement with the 12 statements was converted to a perception of CS as male-oriented score summing up the scores associated with each response (after reversing the scores for negative statements). A higher score thus indicated a stronger belief in the male-orientedness of CS (Table 4.10). Possible scores ranged from 12 to 72. On questions related to gender and perceived skills, male responses demonstrated higher levels of perceptions of Computer Science as male oriented than female responses but on average both groups felt like women are as good with computers as men. For statements like, "I am confident that women can learn computer science," and "There are jobs in computer science suitable for women," there were high levels of agreement among the two groups. The data also revealed that male and female students tend to disagree more with those statements that imply gender bias against women in the field of Computer Science, for example, for the following statement "Computer science is not an appropriate field for women," most of the male and female students disagreed. A significant amount of male and female students also disagreed with the following statement, "I would expect the top computer science student to be a boy." Most of the male and female mean scores showed no significant differences however questions 2, 6 and 8 indicate that males disagree less compared to females.

Table 4.10 Perceptions of Computer Science as Male-oriented.

		(*n* =310)						
		Disagree	Neutral	Agree	Mean Score	Standard Deviation	*p*	*t*
1) I am confident that women can learn computer science.	M	0	11%	89%	5.7	0.85	0.055	1.92
	F	2%	4%	94%	5.5	0.81		
2) I would expect the top computer science student to be a boy.	M	61%	33%	6%	2.1	1.10	0.002	3.17
	F	81%	14%	5%	1.6	1.29		
3) Computer science is not an appropriate field for women.	M	94%	6%	0	1.2	0.79	0.371	0.90
	F	98%	0	2%	1.1	0.71		
4) Most of the people I know that like computers are male.	M	61%	22%	17%	2.3	1.63	0.281	1.08
	F	66%	21%	13%	2.1	1.64		
5) Girls are as good with computers as boys are.	M	39%	50%	11%	2.8	1.45	0.775	0.29
	F	42%	48%	10%	2.8	1.44		
6) Boys like computer games more than girls do.	M	39%	28%	33%	3.4	1.87	0.022	2.31
	F	50%	24%	26%	2.9	1.93		
7) I would expect most people who do computer science are boys.	M	66%	28%	6%	1.9	1.63	0.115	1.58
	F	65%	25%	10%	2.2	1.32		
8) Men don't make better scientists than women do.	M	44%	28%	28%	3.1	1.96	0.049	1.97
	F	34%	30%	36%	3.6	1.89		
9) Girls enjoy reading computer magazines.	M	22%	0	78%	4.7	1.65	0.185	1.33
	F	11%	13%	76%	5.0	1.92		
10) Most people who work with computers are men.	M	50%	44%	6%	2.3	1.25	0.886	0.14
	F	58%	34%	8%	2.4	1.55		
11) There are jobs in computer science suitable for women.	M	11%	11%	78%	4.9	1.69	0.093	1.68
	F	5%	16%	79%	5.3	1.22		
12) Most girls are interested in computers.	M	6%	50%	44%	4.2	1.36	0.350	0.94
	F	11%	46%	43%	4.1	1.54		

Computer Usage and Age. Table 4.11 shows male students who indicated they spent the least amount of time using the computer predicated they thought they would make an A. Women less than 25 years of age were shown to spend the most time using the internet and males over the age 25 spent the most time using productivity software on a weekly basis. Both male and female students were found to spend most of their time on the computer using the internet. The computer usage time among male students under the age 25 was significantly

lower than that of males over the age of 25. On average, students over the age 25 had higher computer self-efficacy scores and higher grade expectations.

Table 4.11 Computer usage among male and female students.

		Males (n=108)	Females (n=202)
How many hours per week do you spend using the internet?	<25 years of age	3.82	13.28
	>25 years of age	11.91	7.22
How many hours per week do you spend playing computer games?	<25 years of age	0.58	1.96
	>25 years of age	2.26	0.69
How many hours per week do you spend using productivity software ?	<25 years of age	2.82	5.98
	>25 years of age	10.61	8.33

Plan to Study Computer Science. Of the 310 student participants surveyed, only 9% indicated that they plan to take computer studies as a subject choice (Table 4.12). The highest percentage (5%) of students indicating their intent to take computer studies as a subject choice was females between the ages of 20 to 30. The lowest percentage (1%) was males 40 and over. The majority of female participants who indicated 'yes' for their intent to take computer studies were freshman with average expected grades of B and mean CSE scores of 7. Male participants who indicated 'yes' were mostly freshman with mean CSE scores of 5.

Table 4.12 Intent to study Computer Science.

Response	Percent	Number
yes	9%	28
maybe	11%	35
no	79%	246

CHAPTER FIVE: ADDITIONAL MODELS

REVISED MODEL ONE

In an attempt to attain a model with high goodness-of-fit measures, additional models were analyzed based on the hypothesized model. After deleting non-significant path coefficients according to their p value, the first additional model was hypothesized with the elimination of the meetings construct. This model is displayed in Figure 5.1 and the standardized coefficient estimates are listed in Table 5.1. The CFI, NFI and GFI are still below recommended goodness-of-fit.

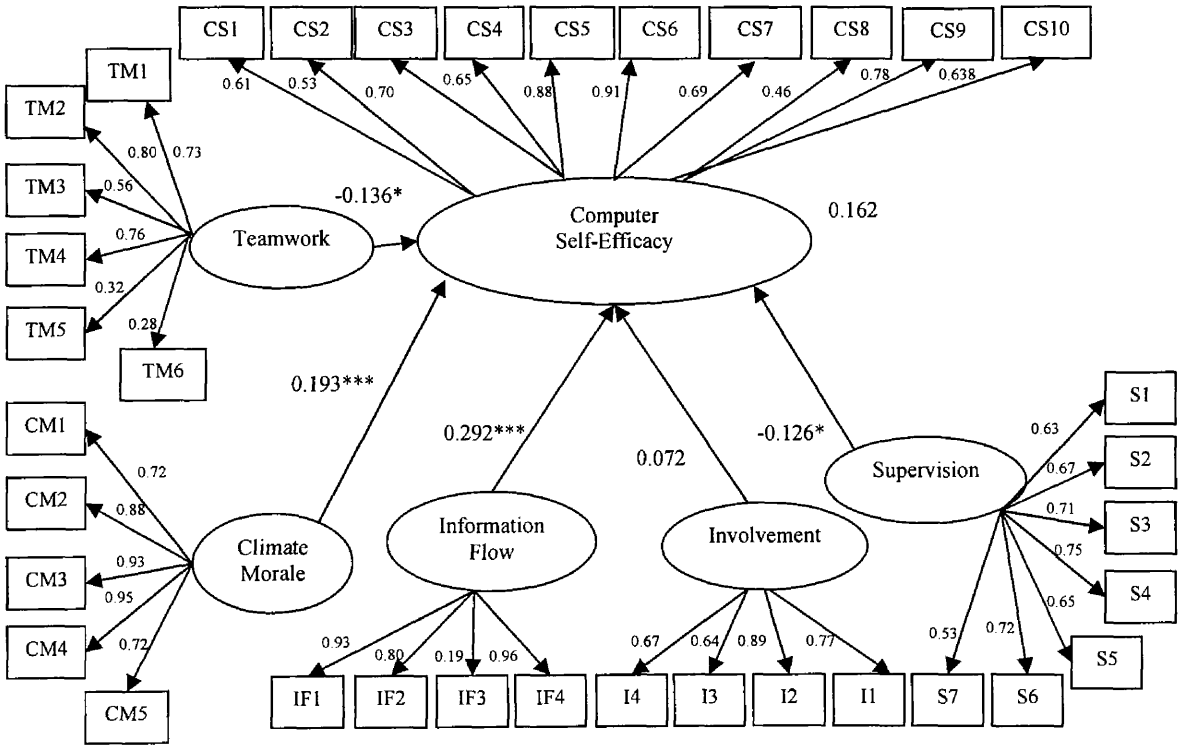


Figure 5.1: Revised Model 1 displaying five of the six constructs: teamwork, supervision, climate and morale, information flow, and involvement. **is used for significance. Error terms have been omitted for clarity.

$\chi^2 = 6083.622, df = 589, p < 0.001, GFI = 0.490, CFI = 0.492, NFI = 0.468, RMSEA = 0.174$

The elimination of the meeting construct has very little effect on the results. The results still indicate an unacceptable fit between the hypothesis model and the observed

data. Teamwork and supervision negatively affect computer self-efficacy and are significant (Table 5.1). Climate and morale and information flow impact CSE positively as hypothesized and the relationships are significant. Involvement appeared to have very little impact and the relationship was not significant. Overall, the model is improved but is still not acceptable.

Table 5.1: Regression coefficient estimates for Revised Model 1.

FACTORS	Estimate	S.E.	C.R.	*p*	Standardized Coefficient
Computer Self-Efficacy←Teamwork	-1.006	0.495	-2.033	0.042*	-0.136
Computer Self-Efficacy←Climate Morale	0.554	0.168	3.298	***	0.193
Computer Self-Efficacy←Information Flow	0.574	0.118	4.860	***	0.292
Computer Self-Efficacy ←Involvement	0.146	0.119	1.229	0.219	0.072
Computer Self-Efficacy ←Supervision	-0.361	0.173	-2.091	0.037*	-0.126

REVISED MODEL TWO

Our second model builds on the structural model in our original hypothesized model and eliminates the meetings and involvement constructs (Figure 5.2). The elimination of these two constructs have very little effect on the results, and teamwork and supervision continue to negatively affect computer self-efficacy with the relationships approaching significance. Climate and morale and information flow continue to show positive relationships with significance. The CFI, NFI, and GFI are better, but the model is not acceptable.

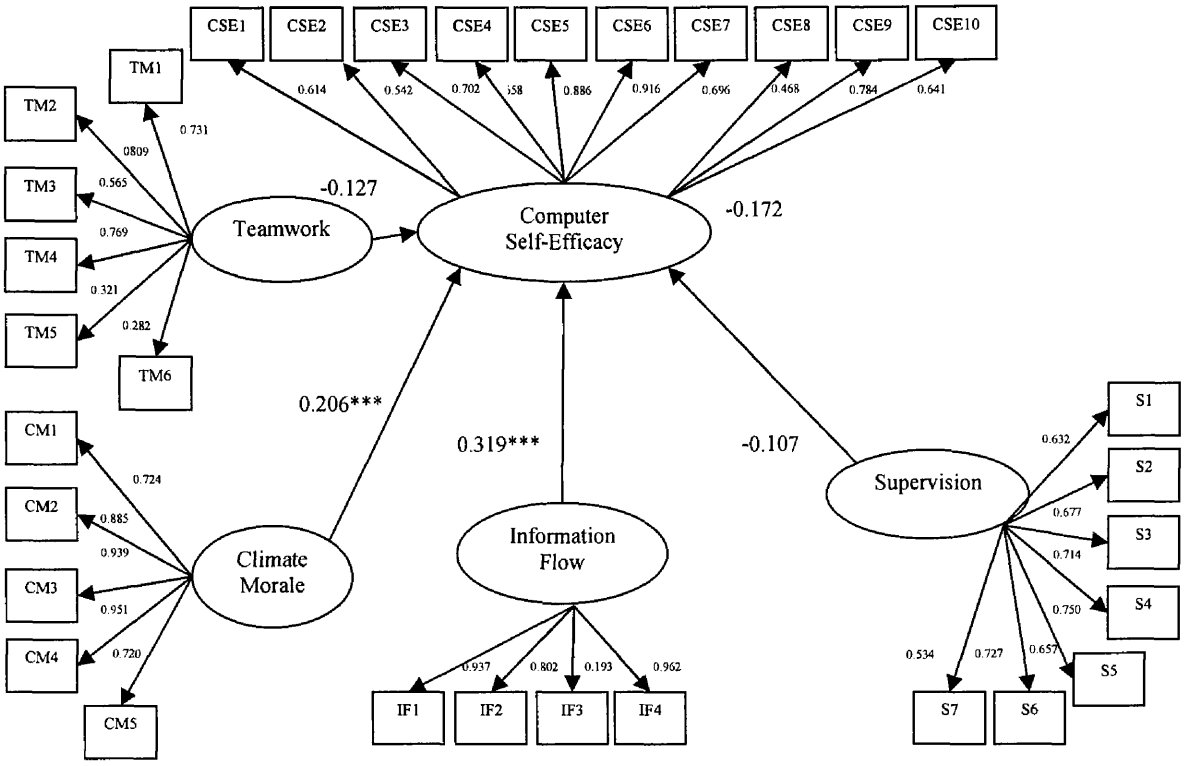


Figure 5.2: Revised Model 2 displaying four of the six constructs: supervision, teamwork, climate and morale and information flow. **is used for significance. Error terms have been omitted for clarity.

$\chi^2 = 4715.878, df = 460, p < 0.001, GFI = 0.533, CFI = 0.532, NFI = 0.508, RMSEA = 0.173$

Table 5.2: Regression coefficient estimates for Revised Model 2.

FACTORS	Estimate	S.E.	C.R.	p	Standardized Coefficient
Computer Self-Efficacy ←Teamwork	-0.949	0.490	-1.939	0.052	-0.127
Computer Self-Efficacy ←Climate Morale	0.597	0.169	3.522	***	0.206
Computer Self-Efficacy ←Information Flow	0.632	0.120	5.271	***	0.319
Computer Self-Efficacy ←Supervision	-0.311	0.172	-1.807	0.071	-0.107

REVISED MODEL THREE

The third model eliminates the supervision, meetings, and involvement constructs. This model is displayed in Figure 5.3.

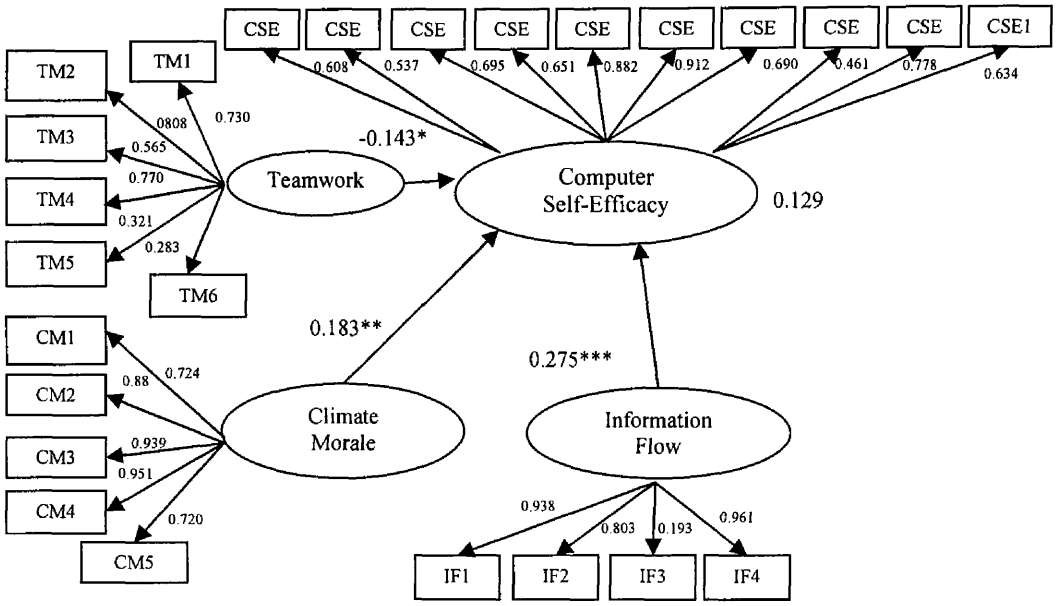


Figure 5.3: Revised Model 3 displaying only three constructs: teamwork, climate and morale and information flow. ** is used for significance. Error terms have been omitted for clarity.
$x^2 = 2589.474, df = 272, p < 0.001, GFI = 0.605, CFI = 0.640, NFI = 0.616, RMSEA = 0.166$

The elimination of these three constructs has little effect on the results; however, CFI, NFI, and GFI have improved. Teamwork consistently appears to have a negative impact of students' computer self-efficacy, and the relationship is significant. Climate and morale and information flow had positive impacts on computer self-efficacy and the p values show the relationships are also significant.

Table 5.3: Regression coefficient estimates for Revised Model 3.

FACTORS	Estimate	S.E.	C.R.	p	Standardized Coefficient
Computer Self-Efficacy ←Teamwork	-1.044	0.500	-2.089	0.037*	-0.143
Computer Self-Efficacy ←Climate Morale	0.521	0.168	3.095	0.002**	0.183
Computer Self-Efficacy ←Information Flow	0.535	0.118	4.537	***	0.275

REVISED MODEL FOUR

Our final model eliminates all of the previously known constructs and creates new constructs based on the factor analysis results provided. Using exploratory factor analysis, we were able to develop a new model with newly named constructs: CSE1, CSE2, and academic culture. This final revised model is displayed in Figure 5.4.

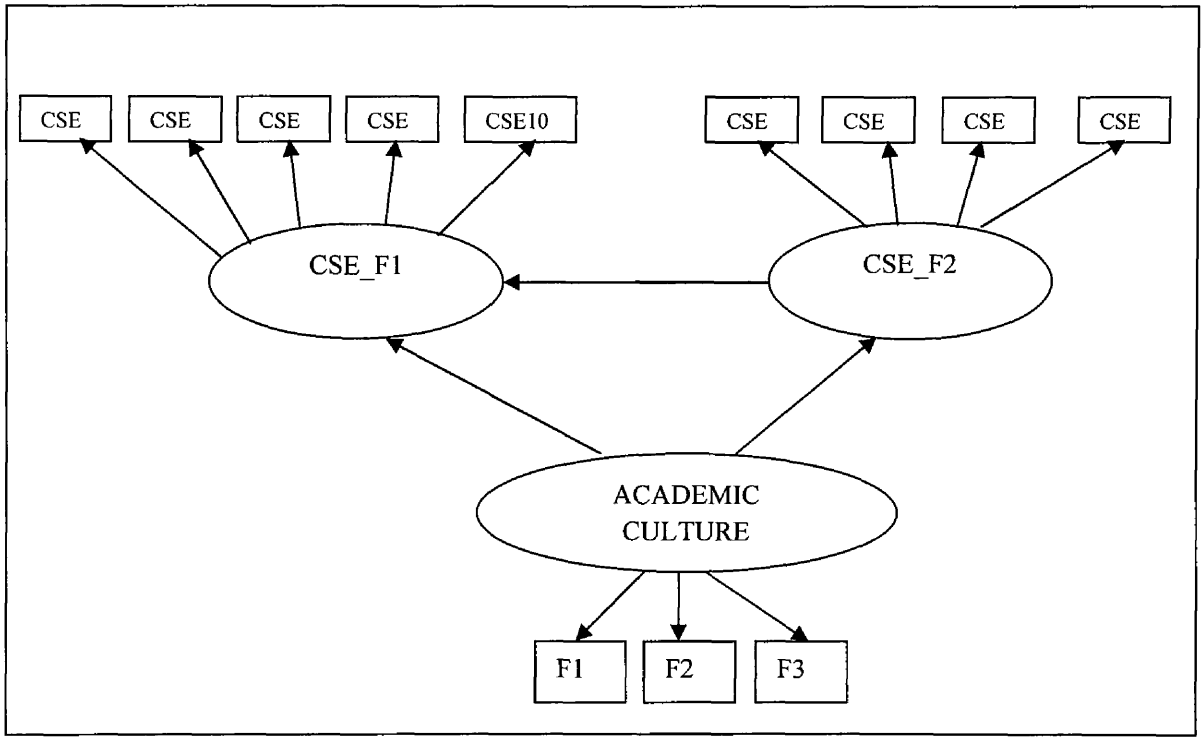


Figure 5.4: Revised Model 4 displaying new constructs: CSE_F1, CSE_F2, and academic culture. Error terms have been omitted for clarity.
$x^2 = 331.848, df = 51, p < 0.001, GFI = 0.783, CFI = 0.811, NFI = 0.786, RMSEA = 0.166$

Table 5.4: Regression coefficient estimates for Revised Model 4.

FACTORS	ESTIMATE	S.E.	C.R.	p	Standardized Coefficient
CSE_F2 ←Academic Culture	0.035	0.039	0.918	0.359	0.075
CSE_F1 ←Academic Culture	-0.198	0.040	-4.952	****	-0.353
CSE_F1← CSE_F2	0.738	0.111	6.622	****	0.625

In our final and best fitting model, computer self-efficacy components are divided into two subgroups (CSE_F1 and CSE_F2), and nineteen of the thirty-one observed variables were used. Instead of creating distinct constructs, the observed variables were grouped to create one academic culture construct. The observed variables for academic culture were chosen based on their factor loading upon further factor analysis (Table 5.5). The results of this assessment produced a GFI measure of 0.783, CFI of 0.811, NFI of 0.786, and RMSEA of 0.166, all of which are better than previous model fit tests and most of the constructs appear to be significant. The results of the final model indicated that the observed variables were cross loading, and there was no way to improve the model. The exploratory factor analysis conducted to eliminate the cross loading observed variables reduced the number of observed variables.

Based on the results of the final model, it was observed that computer self-efficacy Factor 1 was influenced by the computer self-efficacy Factor 2 and Academic Culture. For each standard deviation of Academic Culture increase, students' computer self-efficacy Factor 1 will increase by 0.075 standard deviation, whereas for each standard deviation of computer self-efficacy Factor 2 decrease, students' computer self-efficacy Factor 1 will decrease by 0.353 standard deviation. The overall model implies that a new student academic culture construct should be created to accurately measure computer self-efficacy using the measurement model adopted for this study.

Table 5.5 Factor analysis results for academic culture.

Item Number	Factor Loading			Community	Item-Total Correlation
	Factor 1	Factor 2	Factor 3		
M4	.781			.765	.719
M3	.762			.639	.593
M5	.727			.730	.693
M1	.524			.731	.772
S6	.486			.685	.711
S7	.449			.635	.562
TM6	.323			.650	.621
CM3		.946		.935	.846
CM4		.914		.916	.848
CM2		.882		.820	.826
TM4		.517		.788	.619
CM1		.459		.785	.478
I2			.883	.829	.696
I3			.725	.769	.692
I1			.564	.730	.567
IF2			.530	.644	.585
I4			.478	.742	.465
Internal Consistency Cronbach's Alpha	0.874	0.881	0.809	-------	--------

CHAPTER SIX: DISCUSSION

Problems related to assessment have plagued self-efficacy research (Zimmerman & Kitsantas, 1996). Bandura (1997) cautioned researchers attempting to predict academic outcomes from students' self-efficacy beliefs. He concluded that in order to increase accuracy of prediction, "self-efficacy beliefs should be measured in terms of particularized judgments of capability that may vary across realms of activity, different levels of task demands within a given activity domain, and under different situational circumstances," (Bandura, 1997). Additionally, efficacy beliefs should be assessed at the optimal level of specificity that corresponds to the critical task being assessed and the domain of functioning being analyzed (Bandura, 1997). Based on the information obtained from the survey data, the majority of the participants in this study were freshman students most of which were enrolled in Business majors with only 2% enrolled in Computer Science. The diversification of majors and generality of the survey instrument could have had effects on the results and computer efficacy beliefs among the survey participants. The most general self-efficacy assessments consist of an omnibus-type instrument that attempts to measure a general sense of efficacy or "confidence" (Bandura, 1986). Bandura (1986) argued that such general measures create problems of predictive relevance and are obscure about just what is being assessed. In essence, these instruments assess people's general confidence that they can succeed at tasks and in situations without specifying what these tasks or situations are.

It is possible that this study could have yielded valid results if the sample pool were more specific; for example, Business students only or Computer Science students only. Due to the nature of this study and resources available, such specificity and

concrete validity of the results were unattainable. Lent and Hackett (1987) rightly observed that specificity and precision can be purchased at the expense of external validity and practical relevance. This appears to be the case in this study because the same model was used by Mason (2007) in a workplace environment and the results of that study did exhibit external validity. One possible reason for their success could have been the fact that the subjects surveyed were all exposed to the same work environment, had survey questions relevant to their field of work, and could respond adequately based on similar experiences. Several researchers have examined the issue and concluded that instruments designed to measure computer self-efficacy tend not to differentiate on the distinction of different types of computer self-efficacy, sometimes incorporating multiple types of self-efficacy while ignoring others (Stephens & Shotick, 2002). Given the different types of computer self-efficacy, there should be one scale that measures general computer self-efficacy and multiple scales focusing on the different types of profession-oriented computer self-efficacy and task specific computer self-efficacy. The adoption of such a scale for this study would have been helpful due to the varied educational and professional backgrounds of the students who participated in our survey. Though the measurement model adopted from Compeau and Higgins (1995a) was validated, it may have been unable to obtain satisfactory validity of the structural model assessment because questions used in this survey instrument may have been too vague, repetitive, irrelevant, or unclear in this context.

Martin (1992) argued that a greater understanding of an organization's culture emerges when the researcher approaches the culture from multiple perspectives rather than any single perspective. In a study by Stephens and Shotick (2002), the computer

self-efficacy model is re-evaluated and a new model is developed focusing on technological issues relevant to today's society. In this new computer self-efficacy scale, Stephens and Shotick (2002) created a twenty-one item instrument after reviewing the literature on computer self-efficacy. This instrument analyzed the skills taught in the computer literacy classes of high schools and university undergraduate Business programs and held interviews with end users and employers. During their study they discovered that the user friendliness of technology did improve significantly and the types of skills included in computer literacy have changed.

The results of this study also give insight into the nature of computer self-efficacy and organizational culture and raises questions that may require further research. In this study, it was observed that teamwork was negatively related to students' computer self-efficacy, and this remained consistent throughout the models tested with our students' data. Orhun and Mason (2008) also revealed that teamwork was shown to have negative impacts on computer self-efficacy; however, this finding was not significant. This negative relationship could be caused by many factors. Glaser et al. (1987) defines teamwork as the coordination of efforts, interpersonal cooperation, antagonism, resentment, and power struggles within sections where people talk directly and candidly about problems they have with each other. In most computer applications courses, however, students work individually on computer tasks and tend to judge their abilities on the abilities of others in the classroom. Since computer self-efficacy is also measured in part by the skills of others, students who may have had feelings of high computer self-efficacy may become discouraged when grouped with students who may exhibit higher computer knowledge and skills. Tasa et al. (2007) noted that "the assessment of

capabilities of other people represents one way in which the antecedents of collective efficacy differ from the antecedents of self-efficacy." An individual who may think he is highly skilled in computer self-efficacy could have a lowered self esteem if he realized that his peers are more highly skilled than he is. Similarly an individual with an already low computer self-efficacy will be further discouraged if he/she confirms his beliefs based on the computing skills of others in a group. On the other hand, Sheng el al. (2003) found that teamwork was positively related to individuals' computer self-efficacy, but his findings were also not significant enough to confirm this hypothesis.

The fact that most female students automatically assumed they might get a B compared to their male counterparts who mostly assumed they might get an A, confirms a long held belief that on average males have higher computer self-efficacy than females. Because we were unable to obtain students final grades, it is not possible to determine whether or not males did in fact make higher grades than their female classmates. Some researchers suggest that low self-efficacy is actually a motivating factor for some students and as a result, someone with a high self-efficacy may not prepare sufficiently for a task (Bandura, 1977), which could explain the relationship between high motivation and low computer self-efficacy. This could be open to further research with an analysis of the actual grades received by both groups.

The results of the findings in the hypothesized model indicate that supervision positively affects computer self-efficacy. One suggestion could be that students prefer guided exploration in computer courses rather than completing their assignments without supervision. The study by Bandura (2001) supports this claim and concluded that guided exploration was more effective than unguided exploration, and that unguided students

wasted more time and were more prone to making errors. The data suggest that older students value supervision to a higher extent than younger students. Younger students, however, seemed to have higher computer self-efficacy. Females also seemed to value supervision more than male students. One possible conclusion for this finding could be that male students believe they are more capable of completing tasks and do not see the need for additional supervision. It appears that students who prefer involvement and supervision tend to have lower computer self-efficacy. This is an interesting fact because it is a long held observation that most individuals who work in the computer field usually isolate themselves from others and do not enjoy social interactions (Goodman, 1960). This idea of independence and self reliance appears to increase computer self-efficacy, since the results indicate that students react negatively towards teamwork, meetings, and involvement, all of which require interaction and limit independence. This could be a reason why students appear to place the highest value on information flow. With the lack of social interaction, information flow becomes increasingly important, since it is the only way students can successfully complete tasks with limited social interaction.

Some researchers (Cassidy & Eachus, 2002) report experience with computers as a significant factor in determining computer self-efficacy, with increased experience leading to positive self-efficacy beliefs. In line with previous reports of gender differences in computer self-efficacy (Cassidy & Eachus, 2002), experience was evaluated among male and female students. Females scored higher on computer experience and reported higher levels of computer access. This was unanticipated since most studies (Cassidy & Eachus, 2002) report higher computer experience among males. It can be suggested that the gender difference reported here may be the cause of higher

computer self-efficacy among females in this study since females reported themselves as regular computer users for longer periods than males. In addition, responses suggest that age did have some effect on experience, with older participants having lower programming and software experience scores than younger participants and with males over the age of 25 having the least access to computers. Age effects were anticipated on the basis of the findings reported by Cassidy and Eachus (2002) and Wolfinbarger et al. (2005) and can be considered further evidence that older students tend to have less computer experience.

Computer self-efficacy results implied that females overall had higher computer self-efficacy scores than males. The significance of these results is interesting since most studies reveal opposite results regarding gender and computer self-efficacy. Galpin et al.(2003) generated computer self-efficacy scores for males and females based on the Cassidy and Eachus (2002) computer scale and reported that the median score for the female group was significantly lower than that of the male group (130 versus 141, p <0.01). Cassidy and Eachus (2002) also found that males had significantly higher levels of computer self-efficacy than females. Some studies have explained the gender difference in terms of perceived masculinity of the task; however the results for perceptions of Computer Science scale revealed that girls did not appear to believe that the area of Computer Science was male oriented and boys supported their belief.

It is unclear why the female students gave higher ratings for factors that affect academic culture, computer self-efficacy and perceptions of Computer Science but lower ratings on grade expectations. The implications for this study are that the perceptions of Computer Science and academic culture survey questions may not be accurate indicators

of computer self-efficacy in a university setting. The study also revealed that boys do not perceive the area of Computer Science as male-dominated and strongly believed that women could learn computer Science. As a result, males may not be the ones influencing girls to engage in computer related courses if they do not feel that it is a male-dominated field. This indicates that other sources of influence for females to enroll in this field could be parents, instructors, or media. This puts an increased burden on institutions who wish to close gender gaps in technology fields.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

The results of this study offer several important directions for future research. Firstly, this study represents a preliminary attempt to examine the impact of specific factors of organizational culture on computer self-efficacy beliefs in a university setting. Therefore, the results of the present study should be interpreted with caution. More empirical studies using these six factors in educational settings and additional alternative models are needed before these findings can be finalized.

Based on our results, we can conclude that items on the computer self-efficacy scale should be re-examined and re-validated to reflect questions that accurately measure students' computer self-efficacy skills in a university or education based setting. The instrument was originally developed for assessing organization culture. It had good internal consistency and good test-retest reliability. Cronbach's alpha coefficient ranged from 0.82 to 0.91 (Glaser, Zamanou, & Hacker, 1987), and Person's correlation coefficient ranged from 0.75 to 0.91. Its contents were based on previous literatures, and subscales were extracted based on factor analysis. However, without any instrument modification or preliminary test regarding appropriateness of the instrument, it was concluded that the instrument would not be suitable in assessing academic culture. The results revealed that the items were cross-loadings across subscales.

The findings suggest that involvement, teamwork, and meetings are negatively related to computer self-efficacy in a university setting. Further research may be beneficial in this area of study to determine why these factors have negative impacts on computer self-efficacy among college students. Climate and morale, supervision and information flow had positive impacts on computer self-efficacy, suggesting that

instructors and administrators could improve computer self-efficacy among college students by focusing on these factors. The analysis of gender groups within the research model indicates that there are gender differences in organizational culture among males and females and that females support factors that have a negative impact on computer self-efficacy to a greater extent than males.

Overall, the results of this study support and confirm findings reported in prior studies and present new finding regarding gender assumptions in the university setting. Because of the disparity in the sample size (females 202, males 108), the results related to gender could be considered inconclusive. The findings from this study suggest that more experience and exposure to computer related tasks may enhance individuals' understanding of computers and how they work. This may help reduce fears of computers and increase confidence in computing skills. Motivation, information flow, and encouragement by instructors could also have significant effects on computer self-efficacy and encourage a larger percentage of women to enter computer related fields. In the future, studying additional aspects of organizational culture and gender may bring about a better understanding of the factors that affect students' computer self-efficacy in education.

GLOSSARY

In this appendix, definitions that link terms in this study are defined.

Term	Definition
AGFI	The degree to which the observed frequencies of occurrence of events in an experiment correspond to the probabilities in a model of the experiment. Also known as best fit.
CFA	Confirmatory factor analysis (CFA) is a statistical technique used to verify the factor structure of a set of observed variables. CFA allows the researcher to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists.
CFI	This measure is directly based on the non-centrality measure. If the index is greater than one, it is set at one and if less than zero, it is set to zero. If the CFI is less than one, then the CFI is always greater than the TLI.
Correlation	A measure of the interdependence of two random variables that ranges in value from −1 to +1, indicating perfect negative correlation at −1, absence of correlation at zero, and perfect positive correlation at +1.
Covariance	A statistical measure of the variance of two random variables that are observed or measured in the same mean time period. This measure is equal to the product of the deviations of corresponding values of the two variables from their respective means.
Construct Reliability	Should be at least .70 for the factor loadings.
CR	An index used to determine how much a task is on schedule. A value of 1.0 is "on schedule." A value less than 1.0 is behind, and larger than 1.0 is ahead of schedule. The critical ratio is derived by dividing the time to scheduled completion by the time expected to finish it.
CSE	A judgment of one's capability to use a computer in the accomplishment of a task.
df	The numbers of known minus the number of free parameters; used in many measures of fit.
Endogenous Variable	A variable that is caused by one or more variable in the model. An endogenous variable may also cause another endogenous variable in the model.
Exogenous Variable	A variable that is not caused by another variable in the model. Usually this variable causes one or more variables in the model.
GFI	The goodness-of-fit index is 1 minus the ratio of the minimum function value and the function value before any model has been fitted. The GFI should be between 0 and 1. If the GFI is negative or much larger than 1, the data probably does not fit the model.

Goodness-of-Fit Test	Goodness of fit tests determines if the model being tested should be accepted or rejected.
Hoelter Index	The index states the sample size at which chi square would not be significant (alpha = .05), i.e., that is how small one's sample size would have to be for the result to be no longer significant.
Indicators	An indicator variable is a variable that is one if a condition is true, and zero if it is false.
Latent Variable (unobserved variable, construct, factor)	A variable in the model that is not measured.
Model Fit	The ability of an over identified model to reproduce the variables' correlation or covariance matrix.
Observed Variable	A variable in the model that is measured.
Over-identified Model	A model for which all the parameters are identified and for which there are more known than free parameters.
p value	A p value is a measure of how much evidence we have against the null hypothesis. The null hypothesis represents the hypothesis of no change or no effect. The null hypothesis of close fit is rejected if p is smaller than a pre-specified level (for example, $p < 0.05$).
RMSEA	This measure is based on the non-centrality parameter. Good models have an RMSEA of .05 or less. Models whose RMSEA is .10 or more have poor fit.
RMSR	This measure is the standardized difference between the observed covariance and predicted covariance. A value of zero indicates perfect fit. A value less than .08 is considered a good fit.
SE	The standard error of a method of measurement or estimation is the standard deviation of the sampling distribution associated with the estimation method.
Standardized Coefficient	These are estimates resulting from an analysis performed on variable that have been standardized so that they have variances of 1.
StDev	The standard deviation measures the variability of data in a sample.
Structural Model	A set of structural equations.
TLI (non-normed fit index)	TLI is similar to NFI, but penalizes for model complexity.
Under-identified Model	A model for which it is not possible to estimate all of the model's parameters.
x^2	Chi-square is the sum of the squared difference between observed and the expected data, divided by the expected data in all possible categories.

REFERENCES

Ansley, J., & Erber, J. T. (1988). Computer interaction: Effect on attitudes and performance in older adults. *Educational Gerontology, 14*, 107-119.

Amabile, T. M. (1988). A model of creativity and innovation in organizations. In B. M. Straw and L. L. Cummings (Eds.). *Research in Organizational Behavior, 10,* 123-167.

Arbuckle, J. (2006). *Amos 7.0 User's Guide*. Amos Development Corporation: Spring House, PA.

Arnold, H. J. (1985). Task performance, perceived competence, and attributed causes of performance as determinants of intrinsic motivation. *Academy of Management Journal, 28*, 876-888.

Badagliacco, J. M. (1990). Gender and race differences in computing attitudes and experience. *Social Science Computer Review, 8,* 42-64.

Balka, E., & Smith, R. (2000). *Women work and computerization*, Boston: Kluwer.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review, 84*, 19-215.

Bandura, A. (1985). Explorations in self-efficacy. In S. Sukemune (Eds.), *Advances in social learning theory*. Tokyo: Kaneko-shoho.

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1988a). Perceived self-efficacy: Exercise of control through self-belief. In J. P. Dauwalder, M. Perrez, & V. Hobi (Eds.), *Annual series of European research in behavior therapy, 2*, 27-29.

Bandura, A. (1995). Self-efficacy in changing societies. Cambridge, England: Cambridge University Press.

Bandura, A. (1997). Self-efficacy: the exercise of control. New York: W.H. Freeman and Company.

Bandura, A. (1998a). Personal and collective efficacy in human adaptation and change. In J. G. Adair, D. Belanger, & K. L. Dion (Eds.), *Advances in psychological science: 1. Personal, social and cultural aspects,* 51-71. Hove, UK: Psychology Press.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52*, 1-26. Palo Alto: Annual Reviews, Inc.

Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: Does the composition of the top team make a difference? *Strategic Management Journal, 10,* 107-124.

Bates, R., Holton, E., & Seyler, D. (1997). Factors affecting transfer of training in an industrial setting. Richard Torraco (ed). *Academy of Human Resource Development 1997 Conference Proceedings*: Baton Rouge, LA Academy of Human Resource Development.

Bentler, P.M. (1995). EQS structural equations program manual, *Multivariate Software*, Encino, CA (1995).

Bentler, P. M, & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*, 588-606.

Bentler, P. M. (1988). EQS structural equations program manual. Los Angeles, CA: BMDP Statistical Software.

Bollen, K. A. (1989). Structural equations with latent variables. New York: John Wiley & Sons.

Browne, M. W., & Cudeck, R. (1993). Single sample cross-validation indices for covariance structures. *Multivariate Behavioral Research, 24*, 445-455.

Byrnes, E., & Johnson, J. H. (1981). Change technology and the implementation of automation in neural health care settings. *Behavior Research Methods and Instrumentation, 13*, 573-580.

Braak, J., & Goeman, K. (2001). *Aspects of self-perceived computer competence and its predictors among university students.* Brussels: Vrije University.

Brosnan, M., & Lee, W. (1998). A cross-cultural comparison of gender differences in computer attitudes and anxiety: The UK and Hong Kong. *Computers in Human Behavior, 14* (4), 559-577.

Brown, A. (1992). Organizational culture: The key to effective leadership and organizational development. *Leadership & Organizational Development Journal, 13*, 3-7.

Byrom, E., & Bingham, M. (2001). *Factors influencing the effective use of technology for teaching and learning: Lessons learned from SEIR*TEC Intensive Site Schools*, (2nd ed). Greensboro, NC: SERVE.

Campion, M.A., Medsker, G.J., & Higgs, A.C. (1993). Relations between work group characteristics and effectiveness: Implications for designing effective work groups. *Personnel Psychology, 46*, 823-850.

Cassidy, S., & Eachus, P. (2002). Developing the computer user self-efficacy (CUSE) scale: Investigating the relationship between computer self-efficacy, gender and experience with computers. *Journal of Educational Computing Research, 26*(2), 169-189.

Chin, W., Marcolin, L. B., & Newsted, P. R. (1996). A partial least squares latent variable modeling approach for measuring interaction effects: results from a monte carlo simulation study and voice mail emotion/adoption study. In DeGross, J. I., Javenpaa, S., and Srinivasan, A. (Eds.), *Proceedings of the Seventeenth International conference on Information Systems*. Cleveland, Ohio.

Chowdhury, S. K., Endres, M. L., & Lanis, T. (2002). Preparing students for success in team work environments: The importance of building confidence. *Journal of Managerial Issues, 14*(3), 346.

Chua, S. L., Chen, D., & Wong, A. F. L. (1999). Computer anxiety and its correlates: A meta-analysis. *Computers in Human Behavior, 15,* 609-623.

Cohen, S. G., & Bailey, D.E. (1997.) What makes teams work: Group effectiveness research from the shop floor to the executive suite? *Journal of Management, 23*(3), 239-290.

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly, 19*(2), 189-211.

Coffin, R., & Mackintyre, P. (2000). Cognitive, motivation, and affective processes associated with computer related performance: A path analysis. *Computers in Human Behavior, 16* (2), 199-222.

Czaja, S. J., Hammond, K., Blascovich, J. J. & Swede, H. (1989). Age related differences in learning to use a text-editing system. *Behavior and Information Technology, 8*, 309-319.

Deng, X., Doll, W. J., & Truong, D. (2004). Computer self-efficacy in an ongoing context. *Behavior & Information Technology, 6*, 23, 395-412.

Dill, D. (1982). The management of academic culture: Notes on the management of meaning and social integration. *Higher Education, 11*(3), 303-320.

Dyck, J. L., & Smither, J. A. (1996). Older adults' acquisition of word processing: The contribution of cognitive abilities and computer anxiety. *Computers in Human Behavior, 12*, 107-119.

Elias, P. K., Elias, M. F., Robbins, M. A., & Gage, P. (1987). Acquisition of word processing skills of younger, middle age, and older adults. *Psychology and Age, 2*, 340-348.

Fernández-Ballesteros , R., Diez-Nicolas, J., Caprara, G. V., Barbaranelli, C., & Bandura, A. (2002). Determinants and structural relation of personal efficacy to collective efficacy. *Applied Psychology: An International Review, 51*(1), 107-125.

Galpin et al. (2003). Computer self-efficacy, gender, and educational background in South Africa. *IEEE Technology and Society, 22*(3), 43-48.

Gist, M. E., & Mitchell, T. R. (1992). Self-efficacy: a theoretical analysis of its determinants and malleability. *Academy of Management Review, 17*, 183-211.

Gist, M. E., Silver, W. S., & Mitchell, T. R. (1988). The impact of self-efficacy on casual attributions of successful and unsuccessful performance. Unpublished manuscript, University of Washington, Seattle.

Gladstein, D.L. (1984). Groups in context: A model of task group effectiveness. *Administrative Science Quarterly, 29,* 499-517.

Glaser, P. A., & Glaser, S. R. (2006). Service-survey. Glaser & Associates, Inc. Retrieved September 6, 2006, from: http://www.theglasers.com/Service-survey.html

Glaser, S. R., Glaser P. A., & Warford, L. (1994). Participation and involvement: A community college transforms it culture. *Conflict Management in Higher Education, 6*(1).

Glaser, S. R., Zamanou, S., & Hacker, K.F. (1987). Measuring and interpreting organizational culture. *Management Communication Quarterly, 1*, 173-198.

Gomez, L. M., Egan, D. E. & Bowers, C. (1986). Learning to use a text editor: Some learner characteristics that predict success. *Human-Computer Interaction, 2*, 1-23.

Goodman, P (1960). Growing up absurd. New York: Random House.

Harris, S. G. (1994) Organizational culture and individual sense making: A schema-based perspective. *Organization Science, 5*(3), 309-321.

Hackett, G. (1985). The role of mathematics self-efficacy in the choice of math-related majors of college women and men: A path analysis. *Journal of Counseling Psychology, 32*, 47-56.

Hackman, J.R. (1987). The design of work teams. In Handbook of organizational behavior. Ed. J.W. Lorsch. Englewood Cliffs, NJ: Prentice-Hall, 315-342.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis (*6th ed.). Upper Saddle River, NJ: Person Education.

Harrison, S. (1997). How natural habitat patchiness affects the distribution of diversity in Californian serpentine chaparral. *Ecology, 78,* 1898-1906.

Hartley, A. A., Hartley, J. T., & Johnson, S.A. (1983). The older adult as a computer user. In aging and technological advances. Eds. P. K. Robinson, J. Livingston and J. E. Birren. New York, NY: Plenum Press.

Hasan, B. (2003). The influence of specific computer experiences on computer self-efficacy beliefs. *Computers in Human Behavior, 19*, 443-450.

Henry, J. W. & Stone, R. W. (1995). A structural equation model of job performance using a computer-based order entry system. *Behavior and Information Technology, 14*, 163-173.

Hoelter, J. W. (1983). The effects of role evaluation and commitment on identity salience. *Social Psychology Quarterly*, *46*, 140-147.

Hu, L., & Bentler, P.M. (1995). Evaluating model fit. In: R.H. Hoyle, Editor, *Structural Equation Modeling: Concepts, Issues and Applications* (pp. 76-99). London: Sage.

Igbaria, M., & Iivari, J. (1995). The effects of self-efficacy on computer usage. *Omega, 23*, 587-605.

Jöreskog, K. G., & Sörbom, D. (1989). *A Guide to the Program and Applications (*2nd ed.). Chicago, Illinois: SPSS Inc.

Karsten, R., & Roth, R. M. (1998). Computer self-efficacy: a practical indicator of student computer competency in introductory IS courses. *Informing Science, 1*(3), 61-68.

Kelley, C. L., & Charness, N. (1995). Issues in training older adults to use computers. *Behavior and Information Technology, 14*, 107-120.

Kvavik, R., Caruso, J. & Morgan, G. (2004). ECAR study of students and information technology: Convenience, connection and control. *Research Study, 5.* Boulder, CO, EDUCAUSE Center for Applied Research.

Lent, R. W., & Hackett, G. (1987). Career self-efficacy: Empirical status and future directions. *Journal of Vocational Behavior, 3*, 347-382.

Locke et al. (1984). Effect of self-efficacy, goals, and task strategies on task performance. *Journal of Applied Psychology, 69*(2), 241-251.

Loyd, B. H., Loyd, E. L., & Gressard, C. (1987). Gender and computer experience as factors in the computer attitudes of middle school students. *Journal of Early Adolescence, 7,* 13-19.

MacCullum R.C., Roznowski, M., & Necowitz, L.B. (1996). Model modification in covariance structure analysis: The problem of capitalization on chance, *Psychological Bulletin,* 111.

Marakas, G. M., Yi, M. Y., & Johnson, R. (1998). The multilevel and multifaceted character of computer self-efficacy: Toward a clarification of the construct and an integrative framework for research. *Information Systems Research, 9*(2), 126-163.

Marcoulides, G. A. (1989). Measuring computer anxiety: The computer anxiety scale. *Educational and Psychological Measurement, 49*, 733-739.

Marquie et al. (2002). Do older adults underestimate their actual computer knowledge? *Behavior and Information Technology, 21*(4), 273.

Martin, J. (1992). Cultures in organizations: Three perspectives. New York: Oxford University Press.

Mason, C. (2007). An empirical examination of the impact of organizational culture has on employees' computer self-efficacy. M.Sc. thesis, Troy University Library.

Mento, A. J., Cartledge, N. D., & Locke, E. A. (1980). Another look at the relationship of expectancy and goal difficulty to task performance. *Organizational Behavior & Human Performance, 25*, 419-440.

Orhun, E., & Mason, J.C. (2008). The impact of organizational culture on knowledge workers' computer self-efficacy. Proceedings of ICICKM 2008. The 5th International Conference on Intellectual Capital, Knowledge Management & Organizational Learning, New York, USA, 9-10 October.

Orhun, E., & Mason, J.C. (2008). Organizational culture factors and gender differences in computer self-efficacy perceptions. Paper presented at the Comparative and International Education Society 52nd Annual Conference, Columbia University, March 17–21.

Pearce, J. A. I., & Ravlin, E. C. (1987). The design and activation of self regulating work groups. *Human Relations, 40*(11), 751-760.

Pedhazur, E. J., & Schmelkin, L. P. (1991). Measurement, design, and analysis: An integrated approach. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Phillips, J. M. (2001). The role of decision influence and team performance in member self-efficacy, withdrawal, statistics with the leader, and willingness to return. *Organizational Behavior and Human Decision Processes, 84*(1), 122.

Reid, M., & Levy, Y. (2008). Integrating trust and computer self-efficacy with TAM: an empirical assessment of customers' acceptance of banking information systems (bis) in Jamaica. *Journal of Internet Banking and Commerce, 12*(3).

Roberts, T. G., & Dyer, J. E. (2003). Practices, capacity, motivation, and barriers in distance education in agricultural education departments. *Proceedings of the 30th National Agricultural Education Research Conference, 30,* 430-442.

Rosen, L. D., Sears, D. C., & Weil, M. M. (1987). Computerphobia. *Behavior Research Methods, Instruments,& Computers, 19,* 167-179.

Ross, S. M., & Lowther, D. L. (2003). Impacts of the Co-nect school reform design on classroom instruction, school climate, and student achievement in inner-city schools. *Journal for Educational Research on Students Placed At Risk, 8(*3), 215-246.

Rozell, E.J., & Gardner, W.L. (2000). Cognitive, motivation and affective processes associated with computer-related performance: a path analysis. *Computers in Human Behavior, 16*, 199-222.

Saleh, H. K. (2006). Computer self-efficacy of university faculty in Lebanon, *Educational Technology Research and Development*, *56*(2), 229-240.

Schunk, D. H., & Gunn, T. P. (1986). Self-efficacy and skill development: influence of task strategies and attributions. *Journal of Educational Research, 79*, 238-244.

Schunk, D. H. (1989). Self-efficacy and cognitive skill learning. In C. Ames & R. Ames (Eds.), *Research on Motivation in Education, 3. Goals and cognitions,* 13-44. San Diego: Academic.

Schunk, D. H. (2000). Learning theories in educational perspectives. Prentice Hall.Shein.

Sheng, Y., Pearson, J. M. & Crosby, L. (2003). Organizational culture and employee's computer self-efficacy: all empirical study. *Information Resources Management Journal, 16,* 42-58.

Silver, W. S., Mitchell, T. R., & Gist, M. E. (1995). Responses to successful and unsuccessful performance: the moderating effect of self-efficacy on the relationship between performance and attributions. *Organizational Behavior and Human Decision Processes, 62*, 286-299.

Spreitzer, G. M. (1995) Psychological empowerment in the workplace: dimensions, measurement, and validation. *Academy of Management Journal, 38*, 1442-1465.

Spreitzer, G. M., De Janasz, S. C., & Quinn, R. E. (1999). Empowered to lead: the role of psychological empowerment in leadership. *Journal of Organizational Behavior, 20*, 511-526.

Stephens, P., & Shotick, J. (2001). Computer literacy and incoming business Students: assessment, design and definition of a skill set. *Issues in Information Systems, 2*, 460-466.

Stephens, P. (2006). Validation of the business computer self-efficacy scale: assessment of the computer literacy of incoming business students. *Journal of Educational Computing Research, 34*(1), 29-46.

Editors of Merriam-Webster Online Dictionary. (n.d.). Student. *Merriam-Webster Online Dictionary*. Retrieved March 16, 2010, from Merriam-Webster Online Dictionary on the World Wide Web: http://www.merriam-webster.com/dictionary/student

Tanaka, J. S., & Huba, G. J. (1985). A fit index for covariance structure models under arbitrary GLS estimation. *British Journal of Mathematical and Statistical Psychology, 38*, 197-201.

Tasa, K., Sears, G., & Schat, A. (2007). A multilevel analysis of the determinants of teamwork behavior. Poster accepted for presentation at the 2007 Society for Industrial and Organizational Psychology conference, April 2007, New York, NY.

Taylor, M. S., Locke, E. A., Lee, C. & Gist, M. E. (1984). Type a behavior and faculty research productivity: what are the mechanisms? *Organizational Behavior and Human Decision Processes, 34*, 402-418.

Taylor, J. R. (1997). *An introduction to Error Analysis*, 268. University Science Books.

Thorndike, R. L. (2005). Educational measurement, Washington, DC: American Council on Education.

Torkzadeh, G., & Van Dyke, T. (2001). Development and validation of an internet self-efficacy scale," *Behavior and Information Technology, 20*(4), 275-280.

Torkzadeh, G., & Doll, W. J. (1999). The development of a tool for measuring the perceived impact of information technology on work. *OMEGA, 27*, 327-339.

Torkzadeh, G., Koufteros, X., & Pflughoeft, K. (2003). Confirmatory analysis of a computer self-efficacy instrument. *Structural Equation Modeling, 10*(2), 263-275

Trochim, W. M. (2006). *Measurement Validity Types*. Retrieved November 18, 2008, from the Web Center for Social Research Methods Web site: http://www.socialresearchmethods.net/kb/measval.php

Wanous, J. P. & Youtz, M. A. (1986). Solution diversity and the quality of group decisions. *Academy of Management Journal, 29,* 149-158.

Wolfinbarger, M., Gilly, M. C., & Schau, H. J. (2005). Keeping up with the times: Innovation and usage of the internet among later adopters. CRITO Consortium Project. Retrieved February 21, 2008 from: www.crito.uci.edu/consortium

Yeung, A.K., Brockbank, J.W., & Ulrich, D.O. (1991). Organizational culture and human resource practices: An empirical assessment. *Research in Organizational Change and Development, 5,* 59-81.

Zamanou, S., & Glaser, S.A. (1994). Moving toward participation and involvement. *Group & Organization Management, 19*(4), 475-501.

Zimmerman, B. J., & Kitsantas, A. (1996). Self-regulated learning of a motoric skill: The role of goal setting and self-monitoring. *Journal of Applied Sport Psychology, 8,* 60-75.

APPENDICES

A. SURVEY INSTRUMENTS

B. AMOS RESULTS

C. CORRELATION TABLES

D. EXCEL DATA REPORT

APPENDIX A: SURVEY INSTRUMENTS

This appendix contains the survey used to collect data for this study. The survey questionnaire is made up of four parts: Demographics, Computer Self-Efficacy, Student Academic Culture and Perceptions of Computer Science.

A.1 INFORMED CONSENT STATEMENT

Computer self-efficacy has been identified as a key determinant of an individual's beliefs and behavior in using computers. We hope that IS2241 has contributed to the development of your computer self-efficacy. The purpose of this survey is to gather data for an empirical examination of the factors that have an impact on students' computer self-efficacy. Survey results will be useful for understanding those factors and improving the IS2241 course.
The individuals participating in the study are guaranteed confidentiality of their responses. I will be the only person who will have access to the data. You do not have to participate in the survey if they do not want to, and choosing to participate or not will not affect your relationship with Troy University or your grade in the class. For information or questions about the rights of research participants, contact the Troy University Institutional Review Board at 334-670-5649.
It will approximately take 20-30 minutes to complete the survey.

You should keep a copy of this form for your records.

Emrah Orhun, Ph.D.
Computer Science Department
Troy University Montgomery Campus
100 Turner Blvd, Bldg 826
Montgomery, AL 36830
Phone: (334)8327284 E-mail: eorhun@troy.edu

A.2 DEMOGRAPHICS

The survey questionnaire is made up of four parts. Please complete all of the questions in each of the four parts. Answers are given either as short answer fill in the blanks or by marking the choices for your selected answers. Thank you for your inputs and participating in the study.

Information concerning gender and age is requested in this survey only for statistical purposes.

(1) What is your age? _____
(2) What is your gender? Female Male
(3) Please mark all that apply.
full-time student part-time student
25 years of age or older
married or with a domestic partner
have children
working full time working part-time
(4) How many years and months have you attended college?
Years _____ Months _____
(5) What is your academic classification? (Please mark)
Freshman Sophomore Junior Senior
(6) Of the listed education certificates, please select your current level of achievement?
High school diploma
Some college hours of credit
College degree
College degree and some graduate semester hours of credit
Masters degree and continuing education hours of credit
(7) What field of study are you majoring in? _____
(8) Do you intent to take computer studies as a subject choice: yes no maybe

PRIOR EXPERINCE
(9) Approximately how often do you use computers?
every day three times a week once a week
once a month less than once a month
(10) How many hours per week do you spend:
- Using the internet _____
- Playing computer games _____
- Using productivity software (e.g. word, spreadsheets etc) _____

(11) Had you had computer programming experience before entering IS2241? Yes No
(12) Had you used productivity software before entering IS2241? Yes No
(13) Do you have access to a computer when you are not at University? Yes No
(14) What final grade do you expect for IS2241? _____

A.3 COMPUTER SELF-EFFICACY

This part of the questionnaire asks you about your ability to use an unfamiliar piece of software. In a college courses you are often presented with a software application package to use for coursework. For the following questions, imagine that you were given a new software package for some aspect of your coursework. It doesn't matter specifically what this software package does, only that it is intended to make your class assignments easier and that you have never used it before.

The following questions ask you to indicate whether you could use this unfamiliar software package under a variety of conditions. For each of the conditions, please indicate whether you think you would be able to complete your assignments using the software package by typing the corresponding number based on your confidence level.

Please indicate the strength of your agreement/disagreement with the statements using the 5-point scale shown below by selecting the most appropriate:

1 - To a Very Little Extent
2 - To a Little Extent
3 - To Some Extent
4 - To a Great Extent
5 - To a Very Great Extent

For example, consider the following sample item:

I COULD COMPLETE THE ASSIGNMENT USING THE SOFTWARE PACKAGE…

…if there was someone giving me step by step instructions.
X Yes □No

The sample response shows that the individual felt they could complete the assignment using the software with systematic instructions ("Yes" is selected) and they were moderately confident that they could do so ("3" is selected).

If on the other hand, the individual did not think they could complete the assignment using the software with step by step instructions, they would have selected "No" and move on to the next question.

I COULD COMPLETE THE ASSIGNMENT USING THE SOFTWARE PAGACE ...

	YES	NO
(1) ...if there was no one around to tell me what to do as I go. Disagree 1 2 3 4 5	☐	☐
(2) ...if I had never used a package like it before. Disagree 1 2 3 4 5	☐	☐
(3) ...if I had only the software manuals for reference. Disagree 1 2 3 4 5	☐	☐
(4) ...if I had seen someone else using it before trying it myself. Disagree 1 2 3 4 5	☐	☐
(5) ...if I could call someone for help if I got stuck. Disagree 1 2 3 4 5	☐	☐
(6) ...if someone else had helped me get started. Disagree 1 2 3 4 5	☐	☐
(7) ...if I had a lot of time to complete the job for which the software was provided. Disagree 1 2 3 4 5	☐	☐
(8) ...if I had just the built-in help facility for assistance. Disagree 1 2 3 4 5	☐	☐
(9) ...if someone showed me how to do it first. Disagree 1 2 3 4 5	☐	☐
(10) ...if I had used similar packages before this one to do the type of assignment. Disagree 1 2 3 4 5	☐	☐

A.4 STUDENT ACADEMIC CULTURE SURVEY

The following statements are about the culture of your academic environment. Please indicate the strength of your agreement/disagreement with the statements using the 5-point scale shown below by selecting the most appropriate:
1 - To a Very Little Extent
2 - To a Little Extent
3 - To Some Extent
4 - To a Great Extent
5 - To a Very Great Extent
Please circle the number that indicates your level of agreement or disagreement in the text box provided.

1) Students I work with are direct and honest with each other.
Disagree 1 2 3 4 5

2) Students I work with accept criticism without becoming defensive.
Disagree 1 2 3 4 5

3) Students I work with function as a team.
Disagree 1 2 3 4 5

4) Students I work with constructively confront problems.
Disagree 1 2 3 4 5

5) Students I work with are good listeners.
Disagree 1 2 3 4 5

6) Students and instructors have a productive working relationship.
Disagree 1 2 3 4 5

7) This university motivates me to put out my best efforts.
Disagree 1 2 3 4 5

8) This university respects its students.
Disagree 1 2 3 4 5

9) This university treats people in a consistent and fair manner.
Disagree 1 2 3 4 5

10) There is an atmosphere of trust in this university.
Disagree 1 2 3 4 5

11) This university motivates people to be efficient and productive.
Disagree 1 2 3 4 5

12) I get enough information to understand the big picture for the course.
Disagree 1 2 3 4 5

13) When changes are made to the course outline, the reasons why are made clear.
Disagree 1 2 3 4 5

14) I know about other classes outside of my own.
Disagree 1 2 3 4 5

15) I get the information I need to do my coursework well.
Disagree 1 2 3 4 5

16) I have a say in decisions that affect my class work.
Disagree 1 2 3 4 5

17) I am asked to make suggestions for improving my coursework.
Disagree 1 2 3 4 5

18) This university values the ideas of students at every level.
Disagree 1 2 3 4 5

19) My opinions count in this university.
Disagree 1 2 3 4 5

20) Course requirements are made clear by my instructor.
Disagree 1 2 3 4 5

21) When I do a good job my supervisor tells me.
Disagree 1 2 3 4 5

22) My instructor takes criticism well.
Disagree 1 2 3 4 5

23) My instructor delegates responsibility.
Disagree 1 2 3 4 5

24) My instructor gives me criticism in a positive manner.
Disagree 1 2 3 4 5

25) My instructor is a good listener.
Disagree 1 2 3 4 5

26) My instructor tells me how I'm doing.
Disagree 1 2 3 4 5

27) Decisions made in class get put into action.
Disagree 1 2 3 4 5

28) Everyone takes part in discussions in class.
Disagree 1 2 3 4 5

29) Our discussions in class stay on track.
Disagree 1 2 3 4 5

30) Time in class is time well spent.
Disagree 1 2 3 4 5

31) Class discussions tap the creative potential of the people present.
Disagree 1 2 3 4 5

A.5 PERCEPTIONS OF COMPUTER SCIENCE

This part of the survey is interested in the effects of gender and experience on perceptions of Computer Science. The statements below are concerned with how you may feel about computers and computer science. Please indicate you level of agreement or disagreement with each of the separate statements using the 6-point scale shown below by selecting the most appropriate:

1 – Strongly Disagree
2 - To a Little Extent
3 - To Some Extent
4 - To a Great Extent
5 - To a Very Great Extent
6 – Strongly Agree

Please circle the number that indicates your level of agreement or disagreement in the text box provided.

1) Most difficulties I encounter when using computers I can usually deal with.
Strongly disagree 1 2 3 4 5 6 Strongly agree

2) I find working with computers very easy.
Strongly disagree 1 2 3 4 5 6 Strongly agree

3) I am confident that women can learn computer science.
Strongly disagree 1 2 3 4 5 6 Strongly agree

4) I am very unsure of my abilities to use computers.
Strongly disagree 1 2 3 4 5 6 Strongly agree

5) I would expect the top computer science student to be a boy.
Strongly disagree 1 2 3 4 5 6 Strongly agree

6) Computers frighten me.
Strongly disagree 1 2 3 4 5 6 Strongly agree

7) I enjoy working with computers.
Strongly disagree 1 2 3 4 5 6 Strongly agree

8) I find computers get in the way of learning.
Strongly disagree 1 2 3 4 5 6 Strongly agree

9) Computer science is not an appropriate field for women.
Strongly disagree 1 2 3 4 5 6 Strongly agree

10) Computers make me much more productive.
Strongly disagree 1 2 3 4 5 6 Strongly agree

11) I am very confident in my abilities to use computers.
Strongly disagree 1 2 3 4 5 6 Strongly agree

12) I find it difficult to get computers to do what I want them to do.
Strongly disagree 1 2 3 4 5 6 Strongly agree

13) At times I find working with computers very confusing.
Strongly disagree 1 2 3 4 5 6 Strongly agree

14) Most of the people I know that like computers are male.
Strongly disagree 1 2 3 4 5 6 Strongly agree

15) Girls enjoy reading computer magazines.
Strongly disagree 1 2 3 4 5 6 Strongly agree

16) I would rather that we did not have to learn to use computers.
Strongly disagree 1 2 3 4 5 6 Strongly agree

17) Boys like computer games more than girls do.
Strongly disagree 1 2 3 4 5 6 Strongly agree

18) I seem to waste a lot of time struggling with computers.
Strongly disagree 1 2 3 4 5 6 Strongly agree

19) Using computers makes learning more interesting.
Strongly disagree 1 2 3 4 5 6 Strongly agree

20) I would expect that most people who choose to do computer science would be boys.
Strongly disagree 1 2 3 4 5 6 Strongly agree

21) I always seem to have problems when trying to use computers.
Strongly disagree 1 2 3 4 5 6 Strongly agree

22) Computer slang baffles me.
Strongly disagree 1 2 3 4 5 6 Strongly agree

23) Computers are far too complicated for me.
Strongly disagree 1 2 3 4 5 6 Strongly agree

24) Men don't make better scientists than women do.
Strongly disagree 1 2 3 4 5 6 Strongly agree

25) Using computers is something I rarely enjoy.
Strongly disagree 1 2 3 4 5 6 Strongly agree

26) Girls are as good with computers as boys are.
Strongly disagree 1 2 3 4 5 6 Strongly agree

27) Computers are good aids to learning.
Strongly disagree 1 2 3 4 5 6 Strongly agree

28) Sometimes, when working with computers, things happen and I don't know why.
Strongly disagree 1 2 3 4 5 6 Strongly agree

29) As far as computers go, I don't consider myself to be very competent.
Strongly disagree 1 2 3 4 5 6 Strongly agree

30) Most people who work with computers are men.
Strongly disagree 1 2 3 4 5 6 Strongly agree

31) Computers help me save a lot of time.
Strongly disagree 1 2 3 4 5 6 Strongly agree

32) There are jobs in computer science that are suitable for women.
Strongly disagree 1 2 3 4 5 6 Strongly agree

33) I find working with computers very frustrating.
Strongly disagree 1 2 3 4 5 6 Strongly agree

34) Most girls are interested in computers.
Strongly disagree 1 2 3 4 5 6 Strongly agree

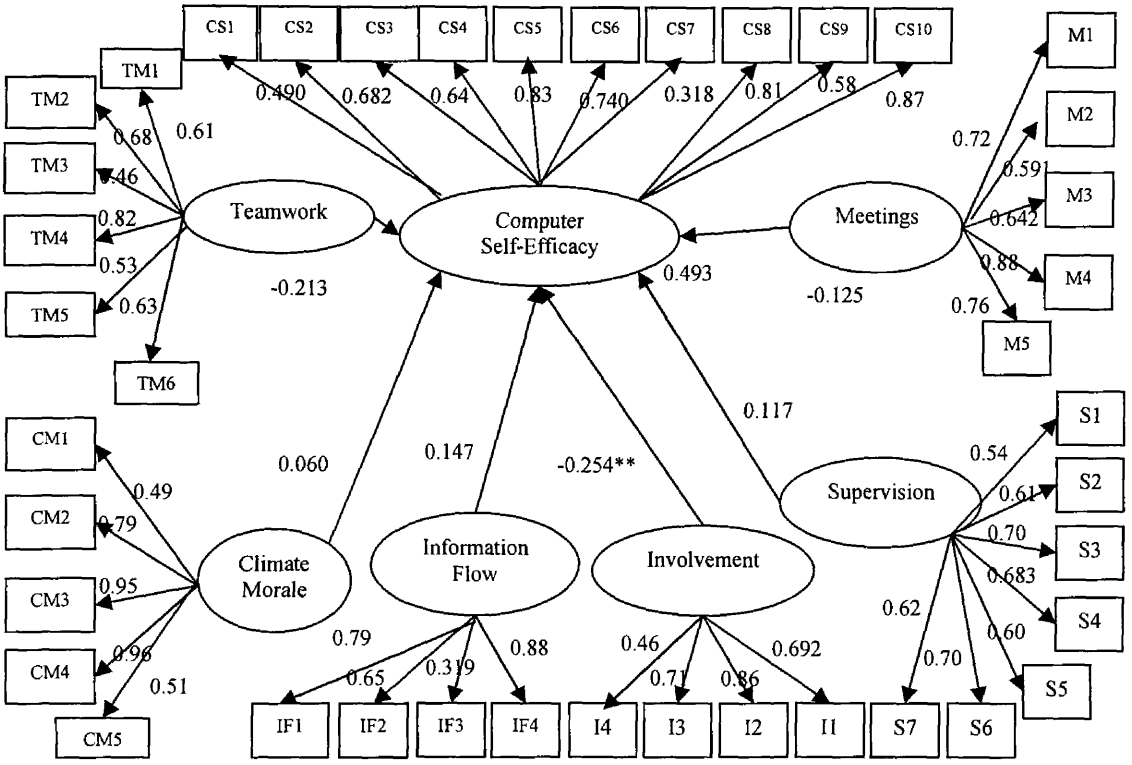
35) I consider myself a skilled computer user.
Strongly disagree 1 2 3 4 5 6 Strongly agree

36) When using a computer I worry that I might press the wrong button and damage it.
Strongly disagree 1 2 3 4 5 6 Strongly agree

APPENDIX B: AMOS RESULTS

In this appendix, five examples are provided for the AMOS results generated. Each example contains an AMOS diagram with the factors studied as well as the chi square value, p value, goodness-of-fit, adjusted goodness-of-fit, normed fit index, comparative fit index, root means square error of approximation and regressive co-efficient values.

B.1 Trial #1 Results for Hypothesis Model



*Error terms have been omitted for clarity

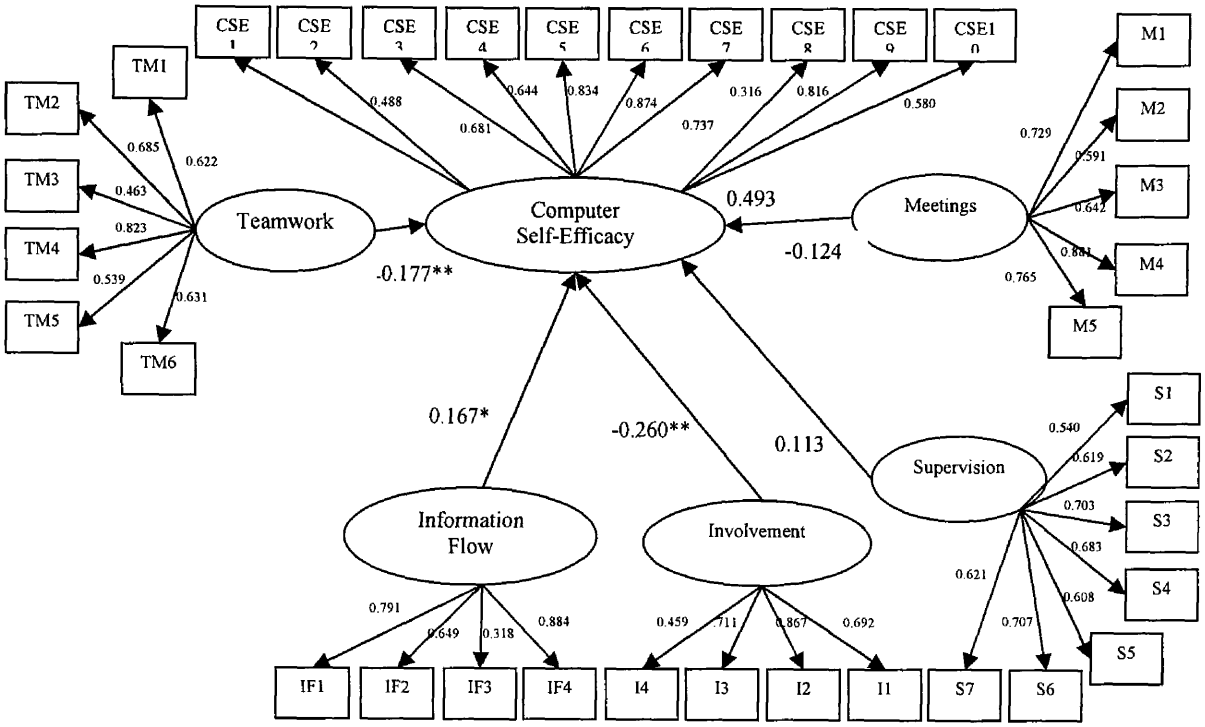
$\chi^2 = 7921.381, df = 773, p < 0.001, GFI = 0.420, CFI = 0.298, NFI = 0.280, RMSEA = 0.214$

B.2 Regression Coefficient Estimates

	Estimate	S.E.	C.R.	*p*	Standardized Coefficient
Computer Self-Efficacy ←Teamwork	-0.583	0.226	-2.579	0.010**	-0.213
Computer Self-Efficacy ←Climate Morale	0.205	0.243	0.846	0.398	0.060
Computer Self-Efficacy ←Information Flow	0.376	0.198	1.905	0.057	0.147
Computer Self-Efficacy ←Involvement	-0.454	0.151	-3.014	0.003**	-0.254

Computer Self-Efficacy ←Supervision	0.468	0.311	1.503	0.133	0.117
Computer Self-Efficacy ←Meeting	-0.264	0.159	-1.660	0.097	-0.125
CSE1←Computer Self-Efficacy	1.000				0.493
CSE2←Computer Self-Efficacy	1.136	0.210	5.421	***	0.490
CSE3←Computer Self-Efficacy	1.376	0.209	6.572	***	0.682
CSE4←Computer Self-Efficacy	1.254	0.196	6.390	***	0.646
CSE5←Computer Self-Efficacy	1.367	0.190	7.195	***	0.835
CSE6←Computer Self-Efficacy	1.427	0.195	7.321	***	0.874
CSE7←Computer Self-Efficacy	1.323	0.194	6.834	***	0.740
CSE8←Computer Self-Efficacy	0.603	0.153	3.928	***	0.318
CSE9←Computer Self-Efficacy	1.308	0.183	7.133	***	0.816
CSE10←Computer Self-Efficacy	1.119	0.185	6.038	***	0.583
M1←Meeting	1.000				0.729
M2←Meeting	0.799	0.101	7.899	***	0.591
M3←Meeting	0.904	0.105	8.591	***	0.642
M4←Meeting	1.260	0.111	11.337	***	0.881
M5←Meeting	1.060	0.104	10.217	***	0.765
S1←Supervision	1.000				0.540
S2←Supervision	1.494	0.236	6.327	***	0.619
S3←Supervision	2.527	0.371	6.805	***	0.703
S4←Supervision	2.252	0.336	6.701	***	0.683
S5←Supervision	2.067	0.330	6.258	***	0.608
S6←Supervision	1.288	0.189	6.825	***	0.707
S7←Supervision	1.962	0.310	6.339	***	0.621
I1←Involvement	1.000			***	0.692
I2←Involvement	1.299	0.142	9.157	***	0.866
I3←Involvement	0.908	0.105	8.659	***	0.712
I4←Involvement	0.498	0.085	5.831	***	0.460
IF1←Information Flow	1.000			***	0.794
IF2←Information Flow	1.036	0.115	8.995	***	0.651
IF3←Information Flow	0.802	0.189	4.243	***	0.319
IF4←Information Flow	0.970	0.094	10.353	***	0.881
TM6←Teamwork	1.000			***	0.632
TM5←Teamwork	0.973	0.152	6.383	***	0.539
TM4←Teamwork	1.663	0.195	8.528	***	0.824
TM3←Teamwork	1.163	0.207	5.611	***	0.464
TM2←Teamwork	1.431	0.186	7.686	***	0.684
TM1←Teamwork	1.488	0.209	7.131	***	0.619
CM5←Climate Morale	1.000			***	0.511
CM4←Climate Morale	2.242	0.276	8.121	***	0.964
CM3←Climate Morale	2.056	0.254	8.096	***	0.952
CM2←Climate Morale	1.717	0.228	7.532	***	0.797
CM1←Climate Morale	1.010	0.176	5.751	***	0.499

B.3 Trial #2 Results for Hypothesis Model



*Error terms have been omitted for clarity

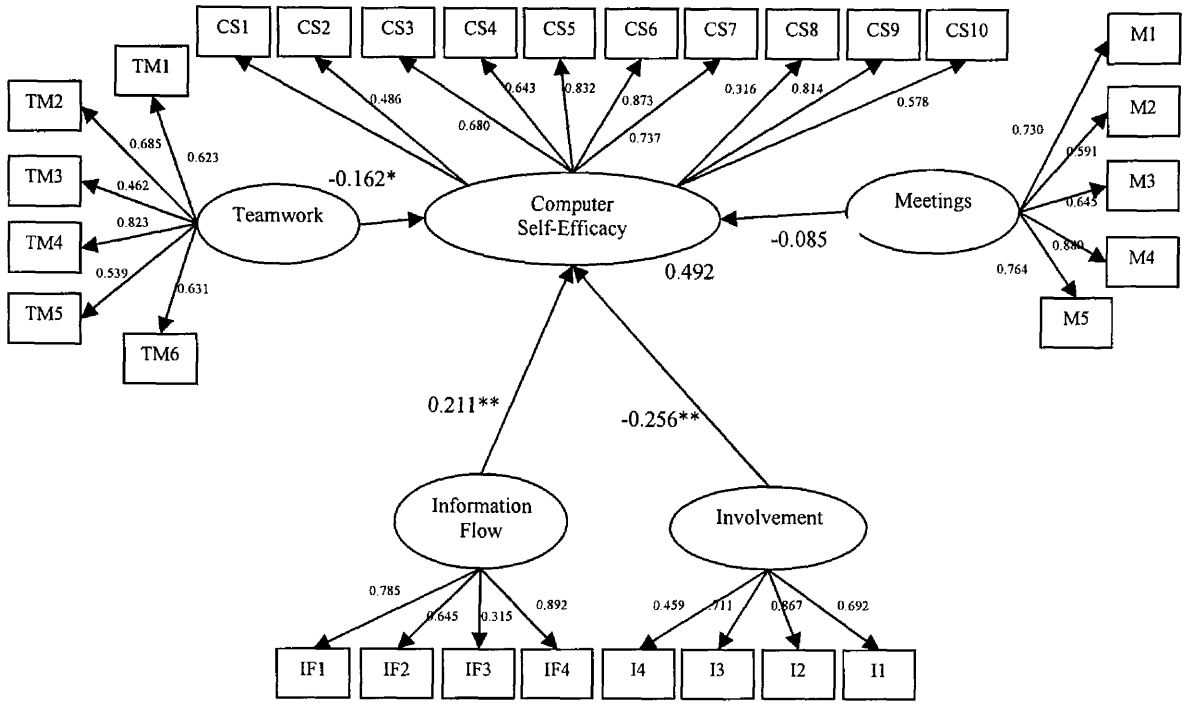
$\chi^2 = 5436.563, df = 589, p < 0.001, GFI = 0.468, CFI = 0.328, NFI = 0.307, RMSEA = 0.202$

B.4 Regression Coefficient Estimates

	Estimate	S.E.	C.R.	*p*	Standardized Coefficient
Computer Self-Efficacy ←Teamwork	-0.486	0.221	-2.198	0.028*	-0.177
Computer Self-Efficacy ←Information Flow	0.429	0.200	2.138	0.032*	0.167
Computer Self-Efficacy ←Involvement	-0.465	0.152	-3.067	0.002**	-0.260
Computer Self-Efficacy ←Supervision	0.451	0.311	1.450	0.147	0.113
Computer Self-Efficacy ←Meeting	-0.260	0.159	-1.631	0.103	-0.124
CSE1←Computer Self-Efficacy	1.000				0.493
CSE2←Computer Self-Efficacy	1.132	0.210	5.397	***	0.488
CSE3←Computer Self-Efficacy	1.375	0.210	6.555	***	0.681
CSE4←Computer Self-Efficacy	1.252	0.197	6.369	***	0.644
CSE5←Computer Self-Efficacy	1.367	0.190	7.178	***	0.834
CSE6←Computer Self-Efficacy	1.427	0.195	7.305	***	0.874
CSE7←Computer Self-Efficacy	1.319	0.194	6.811	***	0.737

CSE8←Computer Self-Efficacy	0.600	0.154	3.906	***	0.316
CSE9←Computer Self-Efficacy	1.307	0.184	7.115	***	0.816
CSE10←Computer Self-Efficacy	1.115	0.186	6.013	***	0.580
M1←Meeting	1.000				0.729
M2←Meeting	0.799	0.101	7.902	***	0.591
M3←Meeting	0.904	0.105	8.595	***	0.642
M4←Meeting	1.259	0.111	11.337	***	0.881
M5←Meeting	1.060	0.104	10.215	***	0.765
S1←Supervision	1.000				0.540
S2←Supervision	1.494	0.236	6.329	***	0.619
S3←Supervision	2.525	0.371	6.807	***	0.703
S4←Supervision	2.251	0.336	6.703	***	0.683
S5←Supervision	2.066	0.330	6.258	***	0.608
S6←Supervision	1.288	0.189	6.827	***	0.707
S7←Supervision	1.962	0.309	6.341	***	0.621
I1←Involvement	1.000			***	0.692
I2←Involvement	1.301	0.142	9.166	***	0.867
I3←Involvement	0.906	0.105	8.658	***	0.711
I4←Involvement	0.496	0.085	5.821	***	0.459
IF1←Information Flow	1.000			***	0.791
IF2←Information Flow	1.037	0.116	8.975	***	0.649
IF3←Information Flow	0.802	0.190	4.230	***	0.318
IF4←Information Flow	0.978	0.094	10.351	***	0.884
TM6←Teamwork	1.000			***	0.631
TM5←Teamwork	0.972	0.153	6.369	***	0.539
TM4←Teamwork	1.661	0.195	8.504	***	0.823
TM3←Teamwork	1.161	0.208	5.594	***	0.463
TM2←Teamwork	1.435	0.187	7.683	***	0.685
TM1←Teamwork	1.496	0.209	7.146	***	0.622

B.5 Trial #3 Results for Hypothesis Model



*Error terms have been omitted for clarity

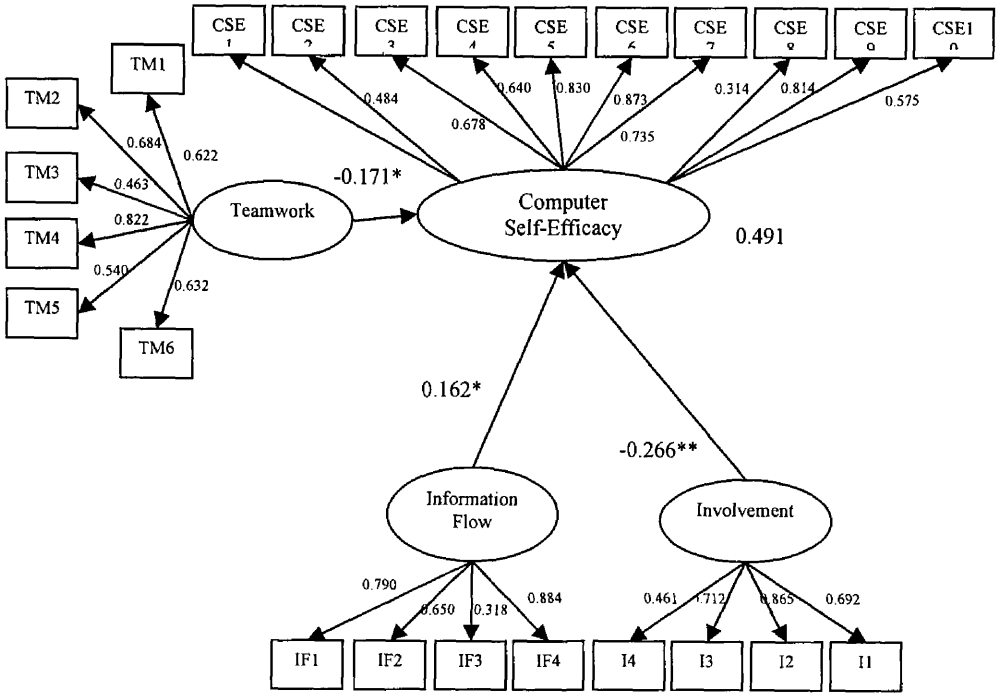
$\chi^2 = 3146.766, df = 373, p < 0.001, GFI = 0.512, CFI = 0.417, NFI = 0.390, RMSEA = 0.192$

B.6 Regression Coefficient Estimates

	Estimate	S.E.	C.R.	*p*	Standardized Coefficient
Computer Self-Efficacy ←Teamwork	-0.443	0.220	-2.016	0.044*	-0.162
Computer Self-Efficacy ←Information Flow	0.547	0.208	2.630	0.009**	0.211
Computer Self-Efficacy ←Involvement	-0.456	0.151	-3.011	0.003**	-0.256
Computer Self-Efficacy ←Meeting	-0.179	0.157	-1.135	0.256	-0.085
CSE1←Computer Self-Efficacy	1.000				0.492
CSE2←Computer Self-Efficacy	1.129	0.210	5.380	***	0.486
CSE3←Computer Self-Efficacy	1.373	0.210	6.545	***	0.680
CSE4←Computer Self-Efficacy	1.251	0.197	6.361	***	0.643
CSE5←Computer Self-Efficacy	1.362	0.190	7.163	***	0.832
CSE6←Computer Self-Efficacy	1.424	0.195	7.293	***	0.873
CSE7←Computer Self-Efficacy	1.318	0.194	6.803	***	0.737
CSE8←Computer Self-Efficacy	0.599	0.154	3.895	***	0.316

CSE9←Computer Self-Efficacy	1.303	0.183	7.101	***	0.814
CSE10←Computer Self-Efficacy	1.112	0.185	5.995	***	0.578
M1←Meeting	1.000				0.730
M2←Meeting	0.799	0.101	7.905	***	0.591
M3←Meeting	0.906	0.105	8.623	***	0.645
M4←Meeting	1.257	0.111	11.328	***	0.880
M5←Meeting	1.059	0.104	10.211	***	0.764
I1←Involvement	1.000			***	0.692
I2←Involvement	1.299	0.142	9.169	***	0.867
I3←Involvement	0.905	0.104	8.661	***	0.711
I4←Involvement	0.496	0.085	5.822	***	0.459
IF1←Information Flow	1.000			***	0.785
IF2←Information Flow	1.039	0.116	8.932	***	0.645
IF3←Information Flow	0.800	0.191	4.195	***	0.315
IF4←Information Flow	0.994	0.096	10.349	***	0.892
TM6←Teamwork	1.000			***	0.631
TM5←Teamwork	0.974	0.153	6.369	***	0.539
TM4←Teamwork	1.662	0.196	8.493	***	0.823
TM3←Teamwork	1.161	0.208	5.587	***	0.462
TM2←Teamwork	1.436	0.187	7.676	***	0.685
TM1←Teamwork	1.500	0.210	7.152	***	0.623

B.7 Trial #4 Results for Hypothesis Model



*Error terms have been omitted for clarity

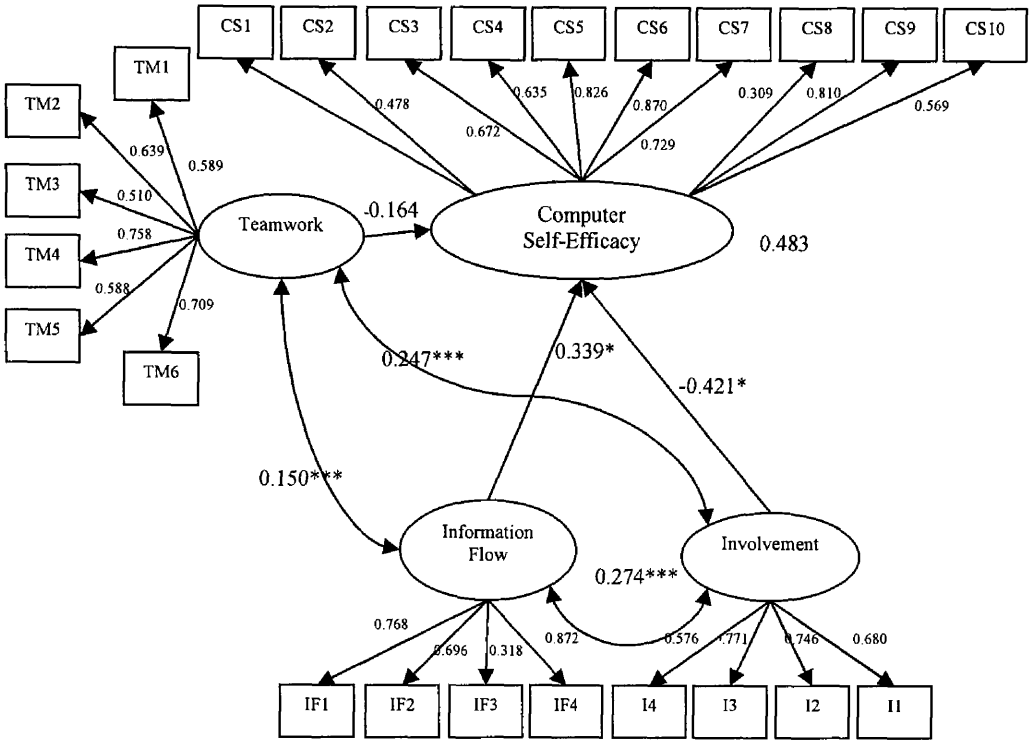
$\chi^2 = 2010.875, df = 249, p < 0.001, GFI = 0.558, CFI = 0.474, NFI = 0.445, RMSEA = 0.188$

B.8 Regression Coefficient Estimates

	Estimate	S.E.	C.R.	p	Standardized Coefficient
Computer Self-Efficacy ←Teamwork	-0.465	0.221	-2.102	0.036*	-0.171
Computer Self-Efficacy ←Information Flow	0.415	0.201	2.059	0.039**	0.162
Computer Self-Efficacy ←Involvement	-0.473	0.153	-3.086	0.002**	-0.266
CSE1←Computer Self-Efficacy	1.000				0.491
CSE2←Computer Self-Efficacy	1.128	0.211	5.349	***	0.484
CSE3←Computer Self-Efficacy	1.372	0.211	6.508	***	0.678
CSE4←Computer Self-Efficacy	1.249	0.198	6.332	***	0.640
CSE5←Computer Self-Efficacy	1.360	0.191	7.123	***	0.830
CSE6←Computer Self-Efficacy	1.424	0.196	7.257	***	0.873
CSE7←Computer Self-Efficacy	1.316	0.195	6.764	***	0.735
CSE8←Computer Self-Efficacy	0.599	0.155	3.870	***	0.314
CSE9←Computer Self-Efficacy	1.304	0.185	7.067	***	0.814
CSE10←Computer Self-Efficacy	1.109	0.186	5.954	***	0.575
I1←Involvement	1.000			***	0.692

I2←Involvement	1.298	0.142	9.165	***	0.865
I3←Involvement	0.908	0.105	8.661	***	0.712
I4←Involvement	0.498	0.085	5.839	***	0.461
IF1←Information Flow	1.000			***	0.790
IF2←Information Flow	1.039	0.116	8.980	***	0.650
IF3←Information Flow	0.803	0.190	4.233	***	0.318
IF4←Information Flow	0.978	0.095	10.341	***	0.884
TM6←Teamwork	1.000			***	0.632
TM5←Teamwork	0.973	0.152	6.386	***	0.540
TM4←Teamwork	1.656	0.195	8.508	***	0.822
TM3←Teamwork	1.160	0.207	5.599	***	0.463
TM2←Teamwork	1.431	0.186	7.684	***	0.684
TM1←Teamwork	1.496	0.209	7.160	***	0.622

B.9 Trial #5 Results for Hypothesis Model



*Error terms have been omitted for clarity

$\chi^2 = 1851.436, df = 246, p < 0.001, GFI = 0.587, CFI = 0.521, NFI = 0.489, RMSEA = 0.180$

B.10 Regression Coefficient Estimates

	Estimate	S.E.	C.R.	p	Standardized Coefficient
Computer Self-Efficacy ←Teamwork	-0.391	0.280	-1.396	0.163	-0.164
Computer Self-Efficacy ←Information Flow	0.874	0.409	2.135	0.033*	0.339
Computer Self-Efficacy ←Involvement	-0.746	0.324	-2.304	0.021*	-0.421
CSE1←Computer Self-Efficacy	1.000				0.483
CSE2←Computer Self-Efficacy	1.132	0.216	5.250	***	0.478
CSE3←Computer Self-Efficacy	1.377	0.216	6.384	***	0.672
CSE4←Computer Self-Efficacy	1.253	0.202	6.200	***	0.635
CSE5←Computer Self-Efficacy	1.365	0.196	6.981	***	0.826
CSE6←Computer Self-Efficacy	1.430	0.201	7.112	***	0.870
CSE7←Computer Self-Efficacy	1.320	0.199	6.630	***	0.729
CSE8←Computer Self-Efficacy	0.599	0.158	3.797	***	0.309
CSE9←Computer Self-Efficacy	1.309	0.189	6.927	***	0.810

CSE10←Computer Self-Efficacy	1.112	0.190	5.842	***	0.569
I1←Involvement	1.000			***	0.680
I2←Involvement	1.138	0.128	8.926	***	0.746
I3←Involvement	1.000	0.109	9.149	***	0.771
I4←Involvement	0.634	0.088	7.162	***	0.576
IF1←Information Flow	1.000			***	0.768
IF2←Information Flow	1.146	0.119	9.641	***	0.696
IF3←Information Flow	0.827	0.194	4.253	***	0.318
IF4←Information Flow	0.993	0.085	11.688	***	0.872
TM6←Teamwork	1.000			***	0.709
TM5←Teamwork	0.944	0.128	7.394	***	0.588
TM4←Teamwork	1.361	0.148	9.228	***	0.758
TM3←Teamwork	1.139	0.176	6.468	***	0.510
TM2←Teamwork	1.191	0.149	7.986	***	0.639
TM1←Teamwork	1.262	0.170	7.412	***	0.589

B.11 Covariances

	Estimate	S.E.	C.R.	*p*
Information Flow↔Teamwork	0.150	0.029	5.244	***
Involvement↔Information Flow	0.274	0.045	6.106	***
Involvement↔Teamwork	0.247	0.046	5.372	***

APPENDIX C: CORRELATION TABLE

This appendix contains the correlation tables for the data collected. There are three correlation tables containing analysis for females, males and the combined group.

C.1 Female correlation analysis tables

The non-parametric Spearman Tau correlation analysis was conducted because the items of the data were 5-point Likert-type scale. Females (n=202):

	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8	CS9	CS10	TM1	TM2	TM3	TM4
CS 1	1.000													
CS 2	.485**	1.000												
CS 3	.409**	.548**	1.000											
CS 4	.494**	.618**	.777**	1.000										
CS 5	.344**	.287**	.542**	.495**	1.000									
CS 6	.283**	.276**	.538**	.474**	0.748**	1.000								
CS 7	.230**	.181**	.427**	.429**	.532**	.581**	1.000							
CS 8	.185**	.338**	.155*	.235**	.239**	.324**	.373**	1.000						
CS 9	.216**	.200**	.398**	.327**	.567**	.715**	.614**	.292**	1.000					
CS 10	.166*	.081	.219**	.230**	.387**	.401**	.748**	.380**	.577**	1.000				
TM 1	.011	-.105	.138*	-.071	-.012	.066	.019	-.140*	-.109	-.085	1.000			
TM 2	-.030	.085	.273**	.035	-.045	-.070	-.066	-.035	-.213**	-.070	.608**	1.000		
TM 3	.093	.080	-.042	.055	-.325**	-.324**	-.164*	-.161*	-.337**	-.197**	.277**	.315**	1.000	
TM 4	.026	.016	.075	.053	-.087	-.162*	-.102	-.069	-.283**	-.186**	.577**	.654**	.394**	1.000
TM 5	.209**	-.127	-.056	.022	-.018	-.118	-.239**	-.297**	-.321**	-.333**	.421**	.278**	.448**	.482**
TM 6	.173*	.046	.168*	.100	-.093	-.166*	-.335**	-.121	-.408**	-.421**	.414**	.515**	.435**	.519**
CM 1	.143*	-.001	-.054	.037	.135	.116	-.027	.049	-.016	-.017	.258**	.122	.202**	.345**
CM 2	.122	.009	-.039	-.004	.111	.026	.106	.001	.007	.186**	.423**	.369**	.239**	.562**
CM 3	-.055	.112	.171*	.189*	.048	-.031	.123	-.082	-.070	.017	.426*	.477*	.244*	.559*
CM 4	.005	.112	.135	.199*	.051	-.062	.055	-.042	-.095	-.081	.401*	.362*	.294*	.569*
C	.06	-	.02	.12	.09	.11	.09	.00	.00	-	.34	.14	.30	.35

	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8	CS9	CS10	TM1	TM2	TM3	TM4
M5	1	.105	8	7	4	0	4	2	2	.121	4*	1*	9*	0*
IF1	.123	-.100	-.006	.032	.021	-.049	-.075	-.194*	-.095	-.203*	.129	.150*	.522*	.141*
IF2	-.048	-.037	.165*	.154*	-.083	-.176*	-.348*	-.295*	-.206*	-.343*	.182*	.292*	.300*	.425*
IF3	-.098	.175*	.059	.028	-.109	-.117	-.213*	-.093	-.137	-.258*	.014	.221*	.342*	.102
IF4	.105	.083	.311*	.210*	.049	.107	.038	-.032	.001	-.086	.212*	.290*	.403*	.300*
I1	-.115	.072	.166*	.011	-.112	-.064	-.232**	-.261**	-.221**	-.243**	.281**	.471**	.413**	.291**
I2	-.199**	-.043	.230**	.128	-.111	-.016	-.276**	-.195**	-.221**	-.290**	.349**	.329**	.206**	.251**
I3	-.057	-.096	.092	.077	-.070	.007	-.074	-.043	-.059	-.265**	.410**	.243**	.241**	.411**
I4	.074	-.154*	-.085	-.012	-.173*	-.272**	-.309**	-.045	-.305**	-.286**	.279**	.256**	.282**	.541**
S1	.079	-.095	.119	-.071	.100	-.038	-.148*	-.035	-.047	-.044	.174*	.201**	.229**	.212**
S2	-.018	-.050	-.042	-.169*	.065	-.026	-.113	-.069	-.050	.009	.217**	.334**	.145*	.325**
S3	.112	.303**	.308**	.156*	.024	.065	-.151*	.086	-.011	-.146*	.224**	.494**	.234**	.364**
S4	-.025	-.007	.027	-.010	.003	-.104	-.213**	-.126	-.090	-.242**	.228**	.312**	.298**	.285**
S5	.111	.216**	.101	.078	.109	.190**	-.075	.200**	.177*	-.062	.142*	.252**	.271**	.228**
S6	.187**	.206**	.251**	.108	-.058	.036	-.188**	-.148*	-.026	-.292**	.267**	.286**	.444**	.336**
S7	.052	.016	.127	.107	.198**	.005	-.087	-.047	-.077	-.112	.237**	.274**	.075	.223**
M1	.074	.027	.190**	.096	-.083	-.014	-.194**	-.006	-.103	-.314**	.370**	.387**	.367**	.326**
M2	-.001	-.142*	.120	-.006	-.134	.030	-.278**	-.150*	-.192**	-.486**	.495**	.258**	.399**	.329**
M3	.197**	.013	.270**	.113	.013	.173*	-.006	-.216**	.160*	-.192**	.306**	.186**	.215**	.141*
M4	.131	-.034	-.006	-.059	-.089	-.024	-.123	-.084	-.012	-.370**	.163*	.080	.107	.120
M5	.024	.168*	.107	.082	-.144*	-.115	-.204**	.134	-.094	-.368**	.086	.129	.054	.090

	TM5	TM6	CM1	CM2	CM3	CM4	CM5	IF1	IF2	IF3	IF4	I1	I2	I3
TM5	1.000													
TM6	.585**	1.000												
CM1	.448**	.579**	1.000											
CM2	.408**	.456**	.685**	1.000										
CM3	.257*	.498*	.518*	.751*	1.000									
CM4	.362*	.546*	.577*	.687*	.906*	1.000								
CM5	.459*	.454*	.672*	.541*	.595*	.687*	1.000							
IF1	.515*	.469*	.464*	.302*	.354*	.395*	.595**	1.000						
IF2	.409*	.530*	.328*	.305*	.495*	.483*	.432**	.525**	1.000					
IF3	-.005	.200*	.005	-.043	.228*	.311*	.164*	.310**	.270**	1.000				
IF4	.369*	.475*	.379*	.330*	.464*	.454*	.501**	.653**	.618**	.312**	1.000			
I1	.259**	.407**	.053	.214**	.380**	.294**	.206**	.450**	.491**	.392**	.484**	1.000		
I2	.184**	.346**	.096	.101	.305**	.246**	.224**	.323**	.508**	.131	.516**	.598**	1.000	
I3	.374**	.429**	.475**	.451**	.513**	.484**	.538**	.469**	.546**	.091	.607**	.351**	.579**	1.000
I4	.421**	.613**	.536**	.468**	.486**	.512**	.495**	.393**	.456**	.003	.397**	.312**	.371**	.598**
S1	.356**	.415**	.377**	.251**	.240**	.358**	.386**	.392**	.500**	.091	.633**	.177*	.133	.265**
S2	.242**	.436**	.450**	.472**	.313**	.279**	.329**	.282**	.371**	.052	.457**	.177*	.240**	.357**
S3	.071	.528**	.379**	.329**	.413**	.411**	.295**	.280**	.499**	.349**	.462**	.349**	.432**	.437**
S4	.229**	.391**	.384**	.219**	.205**	.236**	.373**	.437**	.463**	.239**	.415**	.265**	.422**	.523**
S5	.133	.228**	.422**	.198**	.181**	.259**	.422**	.427**	.304**	.334**	.341**	.257**	.260**	.434**
S6	.380**	.575**	.471**	.348**	.397**	.436**	.401**	.508**	.518**	.193**	.695**	.428**	.439**	.537**
S7	.273**	.548**	.637**	.357**	.443**	.442**	.466**	.512**	.494**	.105	.341**	.187**	.198**	.436**
M1	.386**	.713**	.492**	.289**	.425**	.452**	.503**	.652**	.479**	.209**	.497**	.399**	.468**	.497**
M2	.487**	.578**	.406**	.218**	.293**	.355**	.466**	.452**	.395**	.221**	.463**	.320**	.399**	.653**
M3	.378**	.413**	.298**	.188**	.234**	.219**	.304**	.441**	.414**	.168*	.445**	.356**	.304**	.436**
M4	.319**	.425**	.393**	.185**	.218**	.284**	.456**	.487**	.364**	.217**	.416**	.260**	.268**	.471**
M5	.235**	.477**	.301**	.056	.261**	.352**	.311**	.365**	.330**	.292**	.352**	.336**	.414**	.504**

	I4	S1	S2	S3	S4	S5	S6	S7	M1	M2	M3	M4	M5
I4	1.000												
S1	.232**	1.000											
S2	.328**	.535**	1.000										
S3	.378**	.327**	.590**	1.000									
S4	.301**	.346**	.488**	.551**	1.000								
S5	.268**	.272**	.478**	.604**	.670**	1.000							
S6	.281**	.577**	.445**	.556**	.578**	.521**	1.000						
S7	.406**	.363**	.448**	.464**	.505**	.466**	.410**	1.000					
M1	.532**	.280**	.387**	.589**	.524**	.556**	.632**	.634**	1.000				
M2	.427**	.302**	.158*	.232**	.429**	.336**	.537**	.338**	.589**	1.000			
M3	.158*	.211**	.216**	.262**	.356**	.373**	.529**	.414**	.514**	.513**	1.000		
M4	.260**	.239**	.286**	.361**	.617**	.479**	.578**	.392**	.600**	.475**	.651**	1.000	
M5	.379**	.157*	.221**	.447**	.412**	.457**	.472**	.427**	.644**	.369**	.481**	.698**	1.000

C.2 Correlations for latent variables

	Computer Self-Efficacy	Teamwork	Climate Morale	Information Flow	Involvement	Supervision	Meeting
Computer Self-Efficacy	1.000						
Teamwork	-.135	1.000					
Climate Morale	-.016	.582**	1.000				
Information Flow	-.176*	.448**	.458**	1.000			
Involvement	-.231**	.530**	.426**	.554**	1.000		
Supervision	-.042	.430**	.452**	.598**	.515**	1.000	
Meeting	-.104	.483**	.443**	.589**	.593**	.642**	1.000

C.3 Male correlation analysis tables

The non-parametric Spearman Tau correlation analysis was conducted because the items of the data were 5-point Likert-type scale. Males (n=108):

	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8	CS9	CS10	TM1	TM2	TM3	TM4
CS 1	1.000													
CS 2	.788**	1.000												
CS 3	.500**	.505**	1.000											
CS 4	.618**	.336**	.638**	1.000										
CS 5	.625**	.377**	.503**	.574**	1.000									
CS 6	.574**	.425**	.633**	.650**	.880**	1.000								
CS 7	.614**	.698**	.420**	.486**	.506**	.563**	1.000							
CS 8	.339**	.509**	.622**	.525**	.422**	.609**	.563**	1.000						
CS 9	.457**	.235*	.574**	.747**	.756**	.649**	.429**	.426**	1.000					
CS 10	.556**	.605**	.431**	.351**	.721**	.646**	.870**	.463**	.581**	1.000				
TM 1	.299**	.293**	-.128	.136	-.101	-.190*	-.010	-.177	.050	-.138	1.000			
TM 2	.336**	.331**	-.275**	-.049	.071	-.111	.047	-.264**	.049	.065	.697**	1.000		
TM 3	.287**	-.026	-.054	.162	.334**	.033	-.227*	-.266**	.426**	.004	.479**	.557**	1.000	
TM 4	.285**	.144	-.324**	.200*	.155	.022	.093	.131	.165	.060	.348**	.608**	.524**	1.000
TM 5	.187	-.066	.098	.313**	.191*	.206*	-.109	.168	.190*	-.210*	.233*	.304**	.204*	.297**
TM 6	.419**	.009	.347**	.458**	.397**	.179	.050	.024	.467**	.132	-.095	.062	.402**	.132
CM 1	.222*	-.137	.185	.357**	.230*	.220*	.085	.006	.416**	.054	-.062	.096	.322**	.190*
CM 2	.351**	-.073	.147	.470**	.434**	.443**	.289**	.057	.385**	.252**	-.382**	-.127	-.018	.060
CM 3	.308**	.086	.251**	.596**	.206*	.420**	.448**	.291**	.233*	.159	-.251**	-.287**	-.250**	.018
CM 4	.391**	.008	.061	.477**	.305**	.375**	.399**	.058	.208*	.183	-.183	-.119	-.084	.088
CM 5	.214*	-.080	.076	.480**	.235*	.337**	.382**	.134	.293**	.174	-.200*	-.254**	-.148	.029
IF1	.480**	.106	.212*	.550**	.536**	.449**	.343**	-.059	.662**	.435**	.267**	.107	.415**	.059
IF2	.473**	.202*	-.001	.425**	.133	.157	.351**	-.071	.255**	.250**	.307**	.218*	.228*	.319**

	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8	CS9	CS10	TM1	TM2	TM3	TM4
IF3	.445**	.287**	.382**	.580**	.286**	.321**	.361**	.257**	.395**	.231*	-.122	-.144	-.087	.012
IF4	.408**	.007	.088	.482**	.449**	.370**	.266**	-.177	.545**	.304**	.379**	.191*	.508**	.137
I1	.592**	.305**	.281**	.568**	.450**	.594**	.515**	.215*	.389**	.378**	.151	.140	.157	.244*
I2	.659**	.472**	.408**	.780**	.403**	.530**	.673**	.590**	.492**	.427**	.218*	.010	.045	.383**
I3	.300**	.031	.116	.471**	.160	.325**	.424**	.160	.169	.161	-.231*	-.259**	-.234*	.021
I4	.720**	.450**	.254**	.564**	.422**	.414**	.531**	.130	.559**	.430**	.335**	.332**	.327**	.293**
S1	.419**	.147	.015	.444**	.201*	.174	.436**	.110	.209*	.260**	.037	-.261**	-.144	.024
S2	.789**	.521**	.293**	.681**	.470**	.429**	.610**	.234*	.557**	.506**	.316**	.218*	.220*	.325**
S3	.697**	.530**	.103	.288**	.223*	.166	.397**	.098	.265**	.271**	.419**	.372**	.414**	.372**
S4	.539**	.461**	.020	.249**	-.018	.032	.326**	.081	.102	.117	.507**	.302**	.324**	.351**
S5	.391**	.183	.008	.181	-.090	-.196*	.184	-.057	.017	.044	-.032	.179	.102	.266**
S6	.384**	.046	-.070	.405**	.078	.072	.259**	-.018	.079	.104	-.020	-.148	-.068	.246*
S7	.477**	.360**	.191*	.526**	.213*	.305**	.634**	.315**	.176	.355**	-.133	-.165	-.269**	.070
M1	.618**	.421**	.129	.582**	.275**	.279**	.538**	.121	.359**	.380**	.463**	.190*	.188	.263**
M2	.316**	.168	-.157	.270**	-.080	-.058	.151	.197*	.024	-.110	.645**	.274**	.214*	.470**
M3	.240*	.015	-.174	.317**	.076	.091	.383**	.106	.205*	.194*	.330**	.064	.217*	.399**
M4	-.026	-.206*	-.317**	.002	.002	.117	.039	-.213*	.010	-.047	.348**	.275**	.172	.156
M5	.561**	.277**	.151	.567**	.271**	.322**	.497**	.177	.349**	.297**	.264**	.253**	.282**	.472**

	TM5	TM6	CM1	CM2	CM3	CM4	CM5	IF1	IF2	IF3	IF4	I1	I2	I3
TM5	1.000													
TM6	.467**	1.000												
CM1	.440**	.478**	1.000											
CM2	.212*	.486**	.666**	1.000										
CM3	.185	.254**	.488**	.698**	1.000									
CM4	.250**	.326**	.561**	.815**	.887**	1.000								
CM5	.213*	.250**	.659**	.733**	.874**	.867**	1.000							
IF1	-.038	.271**	.337**	.470**	.211*	.331**	.341**	1.000						
IF2	-.205*	.037	.193*	.397**	.268**	.364**	.221*	.719**	1.000					
IF3	-.109	.249**	.439**	.619**	.601**	.548**	.621**	.289**	.310**	1.000				
IF4	.057	.177	.461**	.395**	.254**	.402**	.430**	.914**	.643**	.205*	1.000			
I1	.168	.025	.593**	.564**	.573**	.650**	.591**	.586**	.625**	.439**	.704**	1.000		
I2	.210*	.133	.309**	.342**	.579**	.543**	.493**	.440**	.575**	.436**	.455**	.740**	1.000	
I3	.132	.221*	.492**	.718**	.938**	.935**	.876**	.255**	.373**	.581**	.282**	.580**	.570**	1.000
I4	.282**	.344**	.589**	.490**	.483**	.573**	.566**	.640**	.551**	.449**	.647**	.717**	.677**	.557**
S1	-.146	.193*	.103	.478**	.527**	.605**	.620**	.505**	.525**	.581**	.402**	.346**	.544**	.641**
S2	-.005	.215*	.302**	.460**	.363**	.473**	.404**	.711**	.763**	.599**	.633**	.707**	.794**	.430**
S3	.183	.247*	.432**	.213*	.300**	.396**	.349**	.373**	.387**	.253**	.459**	.545**	.556**	.349**
S4	.051	.074	.275**	.063	.315**	.285**	.277**	.350**	.492**	.135	.433**	.476**	.528**	.324**
S5	.118	.631**	.380**	.486**	.371**	.424**	.283**	.076	.360**	.386**	-.038	.076	.198*	.440**
S6	-.072	.266**	.130	.459**	.464**	.543**	.494**	.381**	.623**	.489**	.288**	.339**	.512**	.612**
S7	-.074	.236*	.054	.522**	.785**	.728**	.552**	.223*	.417**	.494**	.132	.354**	.593**	.763**
M1	-.170	.036	-.025	.234*	.297**	.339**	.221*	.734**	.863**	.298**	.660**	.559**	.700**	.325**
M2	.360**	-.024	.112	-.048	.094	.160	.143	.271**	.430**	-.061	.359**	.359**	.583**	.127

	TM5	TM6	CM1	CM2	CM3	CM4	CM5	IF1	IF2	IF3	IF4	I1	I2	I3
M3	-.009	-.100	.287**	.215*	.354**	.450**	.432**	.514**	.655**	.073	.642**	.616**	.692**	.433**
M4	.218*	-.298**	.259**	.190*	.162	.325**	.218*	.429**	.475**	-.259**	.569**	.541**	.249**	.270**
M5	.180	.158	.418**	.383**	.528**	.620**	.415**	.444**	.693**	.249**	.552**	.783**	.830**	.582**

	I4	S1	S2	S3	S4	S5	S6	S7	M1	M2	M3	M4	M5
I4	1.000												
S1	.479**	1.000											
S2	.796**	.670**	1.000										
S3	.823**	.357**	.619**	1.000									
S4	.684**	.344**	.502**	.898**	1.000								
S5	.392**	.379**	.317**	.428**	.401**	1.000							
S6	.432**	.836**	.625**	.251**	.257**	.495**	1.000						
S7	.404**	.664**	.493**	.341**	.376**	.521**	.539**	1.000					
M1	.568**	.645**	.824**	.477**	.579**	.218*	.557**	.571**	1.000				
M2	.378**	.379**	.431**	.538**	.644**	.159	.280**	.184	.563**	1.000			
M3	.491**	.513**	.554**	.526**	.615**	.118	.408**	.384**	.686**	.736**	1.000		
M4	.343**	.043	.176	.223*	.316**	-.168	.007	.022	.351**	.453**	.624**	1.000	
M5	.679**	.346**	.694**	.592**	.561**	.312**	.442**	.537**	.661**	.480**	.749**	.494**	1.000

C.4 Correlations for latent variables

	Computer Self-Efficacy	Teamwork	Climate Morale	Information Flow	Involvement	Supervision	Meeting
Computer Self-Efficacy	1.000						
Teamwork	.242*	1.000					
Climate Morale	.429**	.049	1.000				
Information Flow	.452**	.475**	.497**	1.000			
Involvement	.607**	.385**	.710**	.830**	1.000		
Supervision	.375**	.393**	.501**	.684**	.727**	1.000	
Meeting	.316**	.593**	.100	.732**	.717**	.576**	1.000

C.5 Correlation analysis tables for both males and females

The non-parametric Spearman Tau correlation analysis was conducted because the items of the data were 5-point Likert-type scale. Females and males (n=310):

	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8	CS9	CS10	TM1	TM2	TM3	TM4
CS 1	1.000													
CS 2	.592**	1.000												
CS 3	.444**	.521**	1.000											
CS 4	.516**	.499**	.719**	1.000										
CS 5	.442**	.340**	.540**	.520**	1.000									
CS 6	.371**	.321**	.577**	.535**	.809**	1.000								
CS 7	.384**	.379**	.435**	.422**	.543**	.590**	1.000							
CS 8	.221**	.388**	.335**	.336**	.317**	.423**	.448**	1.000						
CS 9	.294**	.198**	.465**	.466**	.638**	.700**	.543**	.344**	1.000					
CS 10	.316**	.285**	.298**	.261**	.519**	.496**	.789**	.415**	.581**	1.000				
TM 1	.149**	.045	.052	-.006	-.041	-.016	.021	-.150**	-.060	-.093	1.000			
TM 2	.143*	.182**	.077	-.015	.004	-.079	-.003	-.106	-.111	-.003	.633**	1.000		
TM 3	.166**	.008	-.047	.063	-.065	-.169**	-.168**	-.191**	-.029	-.118*	.350**	.404**	1.000	
TM 4	.149**	.051	-.053	.078	.014	-.080	-.013	.012	-.109	-.083	.493**	.634**	.447**	1.000
TM 5	.166**	-.106	.003	.151**	.033	-.011	-.191**	-.119*	-.136*	-.291**	.352**	.278**	.346**	.394**
TM 6	.263**	.023	.236**	.243**	.079	-.039	-.200**	-.073	-.079	-.221**	.236**	.345**	.426**	.377**
CM 1	.170**	-.063	.036	.146*	.182**	.164**	.032	.035	.164**	.019	.152**	.123*	.270**	.300**
CM 2	.170**	-.037	.032	.208**	.216**	.177**	.141*	-.007	.148**	.186**	.133*	.163**	.108	.351**
CM 3	.069	.085	.206**	.336**	.115*	.130*	.233**	.042	.054	.068	.190**	.213**	.067	.384**
CM 4	.129*	.038	.093	.306**	.144*	.109	.183**	-.019	.033	.019	.181**	.177**	.138*	.380**
CM 5	.114*	-.110	.050	.260**	.151**	.198**	.202**	.047	.122*	-.012	.146**	.003	.134*	.245**
IF1	.246**	-.029	.085	.220**	.213**	.149**	.079	-.153**	.192**	.037	.179**	.124*	.457**	.108
IF2	.159**	.030	.104	.242**	.006	-.034	-.082	-.219**	-.030	-.120*	.231**	.261**	.247**	.394**

	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8	CS9	CS10	TM1	TM2	TM3	TM4
IF3	.069	.178**	.171**	.238**	.015	.018	-.055	.002	.048	-.099	-.038	.065	.127*	.043
IF4	.219**	.042	.225**	.276**	.204**	.224**	.143*	-.085	.214**	.064	.273**	.258**	.440**	.248**
I1	.131*	.135*	.215**	.202**	.105	.184**	.048	-.099	.003	-.023	.236**	.352**	.301**	.276**
I2	.140*	.110	.308**	.316**	.094	.203**	.113*	.104	.065	-.008	.266**	.200**	.152**	.288**
I3	.061	-.075	.096	.226**	.009	.122*	.113*	.012	.024	-.106	.169**	.059	.033	.269**
I4	.368**	.069	.053	.184**	.068	.009	.050	.018	.041	-.004	.313**	.301**	.294**	.446**
S1	.191**	-.038	.075	.134*	.126*	.048	.063	.007	.055	.073	.120*	.025	.067	.154**
S2	.288**	.152**	.087	.170**	.211**	.148**	.138*	.028	.162**	.183**	.260**	.276**	.149**	.322**
S3	.343**	.378**	.229**	.202**	.123*	.113*	.047	.089	.079	.014	.293**	.437**	.295**	.363**
S4	.200**	.124*	.043	.056	.027	-.013	.028	-.045	.013	-.083	.303**	.313**	.305**	.322**
S5	.243**	.204**	.070	.130*	.055	.051	.012	.098	.120*	-.009	.069	.225**	.200**	.249**
S6	.240**	.132*	.131*	.219**	-.017	.042	-.049	-.117*	-.007	-.164**	.171**	.125*	.225**	.295**
S7	.192**	.132*	.155**	.282**	.188**	.098	.138*	.062	.000	.055	.110	.106	-.075	.160**
M1	.298**	.170**	.173**	.279**	.054	.102	.072	.041	.060	-.052	.406**	.301**	.266**	.298**
M2	.133*	-.066	.018	.063	-.107	.010	-.088	-.014	-.092	-.331**	.524**	.257**	.335**	.378**
M3	.185**	-.005	.108	.158**	.047	.153**	.139*	-.111	.166**	-.045	.311**	.140*	.206**	.227**
M4	.015	-.081	-.113*	-.038	-.071	.009	-.090	-.143*	-.031	-.275**	.249**	.146*	.120*	.122*
M5	.232**	.190**	.139*	.239**	.035	.060	.085	.140*	.086	-.100	.142*	.190**	.170**	.232**

	TM5	TM6	CM1	CM2	CM3	CM4	CM5	IF1	IF2	IF3	IF4	I1	I2	I3
TM5	1.000													
TM6	.541**	1.000												
CM1	.431**	.536**	1.000											
CM2	.337**	.456**	.649**	1.000										
CM3	.225**	.412**	.507**	.723**	1.000									
C	.31	.43	.56	.73	.88	1.0								

	TM5	TM6	CM1	CM2	CM3	CM4	CM5	IF1	IF2	IF3	IF4	I1	I2	I3
M4	2**	4**	0**	2**	8**	00								
CM5	.350**	.367**	.660**	.601**	.697**	.762**	1.000							
IF1	.268**	.391**	.418**	.373**	.308**	.376**	.497**	1.000						
IF2	.155**	.341**	.285**	.348**	.420**	.442**	.355**	.597**	1.000					
IF3	-.035	.216**	.146*	.238**	.352**	.388**	.324**	.302**	.283**	1.000				
IF4	.221**	.353**	.424**	.342**	.393**	.444**	.484**	.752**	.623**	.251**	1.000			
I1	.213**	.263**	.254**	.351**	.454**	.442**	.359**	.499**	.544**	.399**	.567**	1.000		
I2	.164**	.249**	.212**	.172**	.411**	.372**	.348**	.356**	.513**	.191**	.501**	.647**	1.000	
I3	.263**	.317**	.464**	.541**	.674**	.683**	.670**	.373**	.481**	.267**	.472**	.451**	.593**	1.000
I4	.318**	.476**	.564**	.423**	.493**	.542**	.539**	.472**	.484**	.149**	.510**	.466**	.510**	.581**
S1	.138*	.323**	.268**	.343**	.344**	.465**	.481**	.443**	.523**	.270**	.542**	.244**	.284**	.419**
S2	.136*	.350**	.383**	.477**	.337**	.355**	.353**	.447**	.535**	.265**	.508**	.377**	.410**	.382**
S3	.110	.427**	.405**	.288**	.378**	.400**	.319**	.319**	.459**	.308**	.461**	.422**	.443**	.402**
S4	.124*	.265**	.387**	.146**	.281**	.289**	.380**	.402**	.480**	.176**	.453**	.361**	.506**	.482**
S5	.131*	.384**	.409**	.314**	.264**	.325**	.376**	.294**	.330**	.357**	.197**	.203**	.237**	.432**
S6	.211**	.456**	.331**	.394**	.416**	.464**	.423**	.458**	.563**	.300**	.524**	.393**	.424**	.545**
S7	.140*	.430**	.392**	.421**	.555**	.535**	.483**	.392**	.455**	.263**	.240**	.243**	.307**	.554**
M1	.155**	.442**	.281**	.275**	.374**	.397**	.387**	.673**	.623**	.246**	.542**	.455**	.511**	.424**
M2	.418**	.347**	.321**	.109	.231**	.295**	.362**	.369**	.409**	.085	.431**	.328**	.480**	.459**
M3	.223**	.218**	.292**	.204**	.277**	.320**	.354**	.467**	.505**	.133*	.517**	.451**	.432**	.447**
M4	.291**	.166**	.328**	.191**	.175**	.286**	.346**	.456**	.382**	.088	.439**	.363**	.219**	.380**
M5	.193**	.358**	.364**	.168**	.368**	.467**	.373**	.397**	.473**	.248**	.449**	.496**	.590**	.543**

	I4	S1	S2	S3	S4	S5	S6	S7	M1	M2	M3	M4	M5
I4	1.000												
S1	.347**	1.000											
S2	.485**	.590**	1.000										
S3	.558**	.346**	.609**	1.000									
S4	.535**	.348**	.466**	.653**	1.000								
S5	.336**	.316**	.430**	.546**	.557**	1.000							
S6	.304**	.674**	.529**	.451**	.432**	.511**	1.000						
S7	.377**	.472**	.472**	.415**	.426**	.488**	.463**	1.000					
M1	.521**	.432**	.574**	.547**	.511**	.423**	.608**	.612**	1.000				

	I4	S1	S2	S3	S4	S5	S6	S7	M1	M2	M3	M4	M5
M2	.442**	.340**	.252**	.347**	.530**	.269**	.421**	.259**	.557**	1.000			
M3	.284**	.332**	.354**	.361**	.432**	.277**	.485**	.400**	.580**	.592**	1.000		
M4	.242**	.145*	.270**	.328**	.451**	.234**	.378**	.265**	.510**	.439**	.648**	1.000	
M5	.516**	.246**	.387**	.491**	.508**	.412**	.439**	.447**	.627**	.421**	.572**	.588**	1.000

C.6 Correlations for latent variables

	Computer Self-Efficacy	Teamwork	Climate Morale	Information Flow	Involvement	Supervision	Meeting
Computer Self-Efficacy	1.000						
Teamwork	.053	1.000					
Climate Morale	.236**	.313**	1.000				
Information Flow	.188**	.460**	.490**	1.000			
Involvement	.226**	.473**	.599**	.718**	1.000		
Supervision	.195**	.421**	.493**	.655**	.649**	1.000	
Meeting	.152**	.532**	.238**	.678**	.665**	.606**	1.000

APPENDIX D: EXCEL DATA SET

This appendix contains results obtained from the survey questionnaire (Appendix A) distributed to the Troy University student participants. The data is divided into two sets, female data set and male data set.

D.1 Female data set

student	age	Programming Experience	Software experience	computer access	imtent to study cs	>25 Years (yes, no)
1	18	n/a	n/a	no	no	no
2	18	n/a	n/a	no	maybe	no
3	18	no	n/a	no	no	no
4	18	no	n/a	yes	no	no
5	18	no	n/a	yes	maybe	no
6	18	no	no	yes	no	no
7	18	no	no	yes	no	no
8	18	no	no	yes	no	no
9	19	no	no	yes	no	no
11	19	no	no	yes	no	no
12	19	no	no	yes	no	no
13	19	no	no	yes	maybe	no
14	19	no	no	yes	no	no
15	19	no	no	yes	no	no
16	19	no	no	yes	maybe	no
17	19	no	no	yes	no	no
18	19	no	no	yes	yes	no
19	19	no	no	yes	yes	no
20	19	no	no	yes	no	no
21	19	no	no	yes	no	no
22	20	no	no	yes	maybe	no
23	20	no	no	yes	maybe	no
24	20	no	no	yes	no	no
25	20	no	no	yes	no	no
26	20	no	no	yes	no	no
27	20	no	no	yes	yes	no
28	20	no	no	yes	no	no
29	20	no	no	yes	no	no
30	20	no	no	yes	no	no
31	20	no	no	yes	no	no
32	20	no	no	yes	no	no
33	20	no	no	yes	no	no
34	20	no	no	yes	no	no

35	20	no	no	yes	no	no
36	20	no	no	yes	no	no
37	20	no	no	yes	no	no
38	20	no	no	yes	no	no
39	20	no	no	yes	no	no
40	20	no	no	yes	no	no
41	20	no	no	yes	no	no
42	20	no	no	yes	no	no
43	20	no	no	yes	no	no
44	20	no	no	yes	no	no
45	20	no	no	yes	yes	no
46	20	no	no	yes	no	no
47	20	no	yes	yes	no	no
48	21	no	yes	yes	no	no
49	21	no	yes	yes	yes	no
50	21	no	yes	yes	no	no
51	21	no	yes	yes	no	no
52	21	no	yes	yes	no	no
53	21	no	yes	yes	maybe	no
54	21	no	yes	yes	no	no
55	21	no	yes	yes	no	no
56	21	no	yes	yes	no	no
57	21	no	yes	yes	no	no
58	21	no	yes	yes	no	no
59	22	no	yes	yes	no	no
60	22	no	yes	yes	no	no
61	22	no	yes	yes	no	no
62	22	no	yes	yes	no	no
63	23	no	yes	yes	yes	no
64	23	no	yes	yes	yes	no
65	23	no	yes	yes	maybe	no
66	23	no	yes	yes	yes	no
67	24	no	yes	yes	no	no
68	24	no	yes	yes	no	no
69	24	no	yes	yes	no	no
70	24	no	yes	yes	no	no
71	24	no	yes	yes	no	no
72	24	no	yes	yes	yes	no
73	24	no	yes	yes	no	no
74	24	no	yes	yes	no	no
75	24	no	yes	yes	maybe	no
76	24	no	yes	yes	maybe	no
77	24	no	yes	yes	maybe	no

78	24	no	yes	yes	no	no
79	24	no	yes	yes	no	no
80	24	no	yes	yes	no	no
81	24	no	yes	yes	no	no
82	24	no	yes	yes	no	no
83	24	no	yes	yes	no	no
84	24	no	yes	yes	no	no
85	24	no	yes	yes	no	no
86	24	no	yes	yes	no	no
87	24	no	yes	yes	no	no
88	24	no	yes	yes	no	no
89	24	no	yes	yes	no	no
90	24	no	yes	yes	no	no
91	24	no	yes	yes	no	no
92	24	no	yes	yes	no	no
93	24	no	yes	yes	no	no
94	24	no	yes	yes	no	no
95	24	no	yes	yes	no	yes
96	25	no	yes	yes	no	yes
97	25	no	yes	yes	yes	yes
98	25	no	yes	yes	yes	yes
99	25	no	yes	yes	maybe	yes
100	25	no	yes	yes	no	yes
101	26	no	yes	yes	no	yes
102	26	no	yes	yes	no	yes
103	26	no	yes	yes	no	yes
104	26	no	yes	yes	maybe	yes
105	26	no	yes	yes	maybe	yes
106	26	no	yes	yes	yes	yes
107	26	no	yes	yes	no	yes
108	26	no	yes	yes	no	yes
109	26	no	yes	yes	no	yes
110	26	no	yes	yes	no	yes
111	26	no	yes	yes	no	yes
112	26	no	yes	yes	no	yes
113	26	no	yes	yes	no	yes
114	26	no	yes	yes	no	yes
115	27	no	yes	yes	maybe	yes
116	27	no	yes	yes	no	yes
117	27	no	yes	yes	no	yes
118	27	no	yes	yes	maybe	yes
119	27	no	yes	yes	maybe	yes
120	27	no	yes	yes	maybe	yes

121	27	no	yes	yes	no	yes
122	27	no	yes	yes	no	yes
123	27	no	yes	yes	no	yes
124	27	no	yes	yes	no	yes
125	27	no	yes	yes	no	yes
126	28	no	yes	yes	no	yes
127	28	no	yes	yes	maybe	yes
128	28	no	yes	yes	yes	yes
129	29	no	yes	yes	maybe	yes
130	29	no	yes	yes	yes	yes
131	30	no	yes	yes	yes	yes
132	30	no	yes	yes	no	yes
133	31	no	yes	yes	no	yes
134	31	no	yes	yes	maybe	yes
135	32	yes	yes	yes	no	yes
136	33	yes	yes	yes	no	yes
137	33	yes	yes	yes	no	yes
138	33	yes	yes	yes	no	yes
139	33	yes	yes	yes	no	yes
140	33	yes	yes	yes	no	yes
141	33	yes	yes	yes	no	yes
142	34	yes	yes	yes	no	yes
143	34	yes	yes	yes	yes	yes
144	34	yes	yes	yes	no	yes
145	34	yes	yes	yes	no	yes
146	34	yes	yes	yes	no	yes
147	35	yes	yes	yes	no	yes
148	35	yes	yes	yes	no	yes
149	35	yes	yes	yes	no	yes
150	35	yes	yes	yes	no	yes
151	35	yes	yes	yes	no	yes
152	36	yes	yes	yes	no	yes
153	36	yes	yes	yes	yes	yes
154	36	yes	yes	yes	maybe	yes
155	36	yes	yes	yes	maybe	yes
156	36	yes	yes	yes	no	yes
157	36	yes	yes	yes	no	yes
158	36	yes	yes	yes	no	yes
159	36	yes	yes	yes	no	yes
160	36	yes	yes	yes	no	yes
161	37	yes	yes	yes	none	yes
162	37	yes	yes	yes	yes	yes
163	37	yes	yes	yes	no	yes

164	37	yes	yes	yes	no	yes
165	37	yes	yes	yes	no	yes
166	38	yes	yes	yes	no	yes
167	38	yes	yes	yes	maybe	yes
168	38	yes	yes	yes	no	yes
169	38	yes	yes	yes	no	yes
170	38	yes	yes	yes	no	yes
171	38	yes	yes	yes	no	yes
172	38	yes	yes	yes	no	yes
173	39	yes	yes	yes	yes	yes
174	39	yes	yes	yes	maybe	yes
175	39	yes	yes	yes	maybe	yes
176	40	yes	yes	yes	maybe	yes
177	40	yes	yes	yes	maybe	yes
178	41	yes	yes	yes	no	yes
179	43	yes	yes	yes	no	yes
180	44	yes	yes	yes	no	yes
181	44	yes	yes	yes	no	yes
182	44	yes	yes	yes	no	yes
183	44	yes	yes	yes	no	yes
184	44	yes	yes	yes	no	yes
185	44	yes	yes	yes	no	yes
186	44	yes	yes	yes	no	yes
187	44	yes	yes	yes	no	yes
188	47	yes	yes	yes	no	yes
189	47	yes	yes	yes	yes	yes
190	47	yes	yes	yes	yes	yes
191	47	yes	yes	yes	no	yes
192	47	yes	yes	yes	no	yes
193	47	yes	yes	yes	no	yes
194	47	yes	yes	yes	no	yes
195	47	yes	yes	yes	no	yes
196	47	yes	yes	yes	no	yes
197	47	yes	yes	yes	no	yes
198	47	yes	yes	yes	no	yes
199	47	yes	yes	yes	no	yes
200	53	yes	yes	yes	no	yes
201	54	yes	yes	yes	no	yes
202	54	yes	yes	yes	no	yes
203	54		yes	yes	no	yes

Work_Fulltime(yes, no)	married/Partner (yes, no)	havechildren(yes, no)	Major	classification
yes	no	no	nursing	sophomore
yes	no	yes	business	freshman
no	no	no	psychology	freshman
no	no	no	education	junior
no	no	no	business	sophomore
no	no	yes	radiology	junior
yes	no	yes	psychology	senior
no	yes	yes	english	freshman
yes	no	no	business	freshman
no	yes	yes	english	freshman
no	yes	yes	english	freshman
no	yes	yes	nursing	freshman
no	no	yes	business	freshman
yes	no	yes	business	freshman
yes	no	no	accounting	freshman
yes	no	no	accounting	sophomore
no	no	yes	nursing	sophomore
yes	no	yes	business	freshman
no	no	yes	psychology	freshman
no	no	no	criminal justice	sophomore
yes	no	no	nursing	sophomore
no	no	no	psychology	freshman
no	no	no	radiology	sophomore
yes	no	yes	nursing	freshman
yes	no	yes	HRM	freshman
yes	yes	yes	marketing	freshman
no	no	no	criminal justice	freshman
yes	no	no	marketing	freshman
yes	no	yes	psychology	freshman
yes	no	no	accounting	freshman
no	no	yes	nursing	freshman
yes	yes	yes	education	senior
no	no	yes	-	senior
yes	no	yes	business	sophomore
yes	no	no	communications desigr	freshman
yes	yes	no	marketing	junior
yes	yes	yes	business	sophomore
no	no	no	business	graudate
no	no	no	business	freshman
no	no	yes	computer science	freshman
yes	no	no	accounting	junior

yes	yes	yes	business	freshman
yes	yes	yes	psychology	sophomore
yes	no	no	nursing	freshman
no	no	no	psychology	sophomore
yes	yes	yes	psychology	sophomore
yes	yes	yes	accounting	freshman
no	no	no	nursing	sophomore
yes	no	yes	business	freshman
no	no	no	psychology	freshman
no	no	no	education	junior
no	no	no	business	sophomore
no	no	yes	radiology	junior
yes	no	yes	psychology	senior
no	yes	yes	english	freshman
yes	no	no	business	freshman
no	yes	yes	english	freshman
no	yes	yes	english	freshman
no	yes	yes	nursing	freshman
no	no	yes	business	freshman
yes	no	yes	business	freshman
yes	no	no	accounting	freshman
yes	no	no	accounting	sophomore
no	no	yes	nursing	sophomore
yes	no	yes	business	freshman
no	no	yes	psychology	freshman
no	no	no	criminal justice	sophomore
yes	no	no	nursing	sophomore
no	no	no	psychology	freshman
no	no	no	radiology	sophomore
yes	no	yes	nursing	freshman
yes	no	yes	HRM	freshman
yes	yes	yes	marketing	freshman
no	no	no	criminal justice	freshman
yes	no	no	marketing	freshman
yes	no	yes	psychology	freshman
yes	no	no	accounting	freshman
no	no	yes	nursing	freshman
yes	yes	yes	education	senior
no	no	yes	-	senior
yes	no	yes	business	sophomore
yes	no	no	communications desigr	freshman
yes	yes	no	marketing	junior
yes	yes	yes	business	sophomore

no	no	no	business	graudate
no	no	no	business	freshman
no	no	yes	computer science	freshman
yes	no	no	accounting	junior
yes	yes	yes	business	freshman
yes	yes	yes	psychology	sophomore
yes	no	no	nursing	freshman
no	no	no	psychology	sophomore
yes	yes	yes	psychology	sophomore
yes	yes	yes	accounting	freshman
no	no	no	nursing	sophomore
yes	no	yes	business	freshman
no	no	no	psychology	freshman
no	no	no	education	junior
no	no	no	business	sophomore
no	no	yes	radiology	junior
yes	no	yes	psychology	senior
no	yes	yes	english	freshman
yes	no	no	business	freshman
no	yes	yes	english	freshman
no	yes	yes	english	freshman
no	yes	yes	nursing	freshman
no	no	yes	business	freshman
yes	no	yes	business	freshman
yes	no	no	accounting	freshman
yes	no	no	accounting	sophomore
no	no	yes	nursing	sophomore
yes	no	yes	business	freshman
no	no	yes	psychology	freshman
no	no	no	criminal justice	sophomore
yes	no	no	nursing	sophomore
no	no	no	psychology	freshman
no	no	no	radiology	sophomore
yes	no	yes	nursing	freshman
yes	no	yes	HRM	freshman
yes	yes	yes	marketing	freshman
no	no	no	criminal justice	freshman
yes	no	no	marketing	freshman
yes	no	yes	psychology	freshman
yes	no	no	accounting	freshman
no	no	yes	nursing	freshman
yes	yes	yes	education	senior
no	no	yes	-	senior

yes	no	yes	business	sophomore
yes	no	no	communications desigr	freshman
yes	yes	no	marketing	junior
yes	yes	yes	business	sophomore
no	no	no	business	graudate
no	no	no	business	freshman
no	no	yes	computer science	freshman
yes	no	no	accounting	junior
yes	yes	yes	business	freshman
yes	yes	yes	psychology	sophomore
yes	no	no	nursing	freshman
no	no	no	psychology	sophomore
yes	yes	yes	psychology	sophomore
yes	yes	yes	accounting	freshman
no	no	no	nursing	sophomore
yes	no	yes	business	freshman
no	no	no	psychology	freshman
no	no	no	education	junior
no	no	no	business	sophomore
no	no	yes	radiology	junior
yes	no	yes	psychology	senior
no	yes	yes	english	freshman
yes	no	no	business	freshman
no	yes	yes	english	freshman
no	yes	yes	english	freshman
no	yes	yes	nursing	freshman
no	no	yes	business	freshman
yes	no	yes	business	freshman
yes	no	no	accounting	freshman
yes	no	no	accounting	sophomore
no	no	yes	nursing	sophomore
yes	no	yes	business	freshman
no	no	yes	psychology	freshman
no	no	no	criminal justice	sophomore
yes	no	no	nursing	sophomore
no	no	no	psychology	freshman
no	no	no	radiology	sophomore
yes	no	yes	nursing	freshman
yes	no	yes	HRM	freshman
yes	yes	yes	marketing	freshman
no	no	no	criminal justice	freshman
yes	no	no	marketing	freshman
yes	no	yes	psychology	freshman

yes	no	no	accounting	freshman
no	no	yes	nursing	freshman
yes	yes	yes	education	senior
no	no	yes	-	senior
yes	no	yes	business	sophomore
yes	no	no	communications desigr	freshman
yes	yes	no	marketing	junior
yes	yes	yes	business	sophomore
no	no	no	business	graudate
no	no	no	business	freshman
no	no	yes	computer science	freshman
yes	no	no	accounting	junior
yes	yes	yes	business	freshman
yes	yes	yes	psychology	sophomore
yes	no	no	nursing	freshman
no	no	no	psychology	sophomore
yes	yes	yes	psychology	sophomore
yes	yes	yes	accounting	freshman
yes	no	yes	business	sophomore
yes	no	no	communications desigr	freshman
yes	yes	no	marketing	junior
yes	yes	yes	business	sophomore
no	no	no	business	graudate
no	no	no	business	freshman
no	no	yes	computer science	freshman
yes	no	no	accounting	junior
yes	yes	yes	business	freshman
yes	yes	yes	psychology	sophomore
yes	no	no	nursing	freshman
no	no	no	psychology	sophomore
yes	yes	yes	psychology	sophomore
yes	yes	yes	accounting	freshman

fulltime student	Years_In_School	Years_In_College	GradeExpected	Use_PC_Days	Use_Internet_Hours
yes	16	3	A	3	2
yes	13.7	0.7	A	7	10
yes	16.2	3.2	B	1	10
yes	16	3	B	3	4
yes	15	2	C	7	5
no	13.11	0.11	B	1	2
yes	17	4	B	7	2
yes	13.6	0.6	A	7	11
no	14	1	A	7	19
yes	13.4	0.4	A	7	20
yes	13.3	0.3	B	3	5
yes	13.2	0.2	C	3	8
yes	13.2	0.2	B	7	1.5
yes	15	2	B	3	5
yes	13.11	0.11	B	7	7
yes	18.1	5.1	B	7	3
yes	15	2	B	3	24
no	14	1	D	1	3
yes	13	0	B	1	2
yes	15	2	C	3	1
yes	15.2	2.2	B	7	5
yes	15	2	A	7	20
no	14.3	1.3	B	7	1
no	13.2	0.2	B	7	0
yes	13.2	0.2	B	3	20
yes	14	1	B	7	3
yes	13.6	0.6	B	7	75
no	14.3	1.3	B	7	30
yes	13.2	0.2	C	7	0
yes	13.2	0.2	B	7	4
yes	13.2	0.2	B	3	3
no	21.4	8.4	A	7	12
yes	17.1	4.1	C	7	1
no	16.11	3.11	B	7	6
yes	13.4	0.4	B	7	6
no	22	9	B	7	10
yes	15	2	B	7	20
yes	18	5	B	7	3
yes	14.5	1.5	B	3	4
yes	13.4	0.4	C	7	30
no	15	2	A	7	1.5

yes	13.8	0.8	B	7	0
yes	15.8	2.8	C	3	10
yes	13.3	0.3		3	5
yes	15.2	2.2	C	7	21
yes	15	2	B	7	30
yes	13.5	0.5	B	7	2
yes	16	3	A	3	2
yes	13.7	0.7	A	7	10
yes	16.2	3.2	B	1	10
yes	16	3	B	3	4
yes	15	2	C	7	5
no	13.11	0.11	B	1	2
yes	17	4	B	7	2
yes	13.6	0.6	A	7	11
no	14	1	A	7	19
yes	13.4	0.4	A	7	20
yes	13.3	0.3	B	3	5
yes	13.2	0.2	C	3	8
yes	13.2	0.2	B	7	1.5
yes	15	2	B	3	5
yes	13.11	0.11	B	7	7
yes	18.1	5.1	B	7	3
yes	15	2	B	3	24
no	14	1	D	1	3
yes	13	0	B	1	2
yes	15	2	C	3	1
yes	15.2	2.2	B	7	5
yes	15	2	A	7	20
no	14.3	1.3	B	7	1
no	13.2	0.2	B	7	0
yes	13.2	0.2	B	3	20
yes	14	1	B	7	3
yes	13.6	0.6	B	7	75
no	14.3	1.3	B	7	30
yes	13.2	0.2	C	7	0
yes	13.2	0.2	B	7	4
yes	13.2	0.2	B	3	3
no	21.4	8.4	A	7	12
yes	17.1	4.1	C	7	1
no	16.11	3.11	B	7	6
yes	13.4	0.4	B	7	6
no	22	9	B	7	10
yes	15	2	B	7	20

yes	18	5	B	7	3
yes	14.5	1.5	B	3	4
yes	13.4	0.4	C	7	30
no	15	2	A	7	1.5
yes	13.8	0.8	B	7	0
yes	15.8	2.8	C	3	10
yes	13.3	0.3	D	3	5
yes	15.2	2.2	C	7	21
yes	15	2	B	7	30
yes	13.5	0.5	B	7	2
yes	16	3	A	3	2
yes	13.7	0.7	A	7	10
yes	16.2	3.2	B	1	10
yes	16	3	B	3	4
yes	15	2	C	7	5
no	13.11	0.11	B	1	2
yes	17	4	B	7	2
yes	13.6	0.6	A	7	11
no	14	1	A	7	19
yes	13.4	0.4	A	7	20
yes	13.3	0.3	B	3	5
yes	13.2	0.2	C	3	8
yes	13.2	0.2	B	7	1.5
yes	15	2	B	3	5
yes	13.11	0.11	B	7	7
yes	18.1	5.1	B	7	3
yes	15	2	B	3	24
no	14	1	D	1	3
yes	13	0	B	1	2
yes	15	2	C	3	1
yes	15.2	2.2	B	7	5
yes	15	2	A	7	20
no	14.3	1.3	B	7	1
no	13.2	0.2	B	7	0
yes	13.2	0.2	B	3	20
yes	14	1	B	7	3
yes	13.6	0.6	B	7	75
no	14.3	1.3	B	7	30
yes	13.2	0.2	C	7	0
yes	13.2	0.2	B	7	4
yes	13.2	0.2	B	3	3
no	21.4	8.4	A	7	12
yes	17.1	4.1	C	7	1

no	16.11	3.11	B	7	6
yes	13.4	0.4	B	7	6
no	22	9	B	7	10
yes	15	2	B	7	20
yes	18	5	B	7	3
yes	14.5	1.5	B	3	4
yes	13.4	0.4	C	7	30
no	15	2	A	7	1.5
yes	13.8	0.8	B	7	0
yes	15.8	2.8	C	3	10
yes	13.3	0.3		3	5
yes	15.2	2.2	C	7	21
yes	15	2	B	7	30
yes	13.5	0.5	B	7	2
yes	16	3	A	3	2
yes	13.7	0.7	A	7	10
yes	16.2	3.2	B	1	10
yes	16	3	B	3	4
yes	15	2	C	7	5
no	13.11	0.11	B	1	2
yes	17	4	B	7	2
yes	13.6	0.6	A	7	11
no	14	1	A	7	19
yes	13.4	0.4	A	7	20
yes	13.3	0.3	B	3	5
yes	13.2	0.2	C	3	8
yes	13.2	0.2	B	7	1.5
yes	15	2	B	3	5
yes	13.11	0.11	B	7	7
yes	18.1	5.1	B	7	3
yes	15	2	B	3	24
no	14	1	D	1	3
yes	13	0	B	1	2
yes	15	2	C	3	1
yes	15.2	2.2	B	7	5
yes	15	2	A	7	20
no	14.3	1.3	B	7	1
no	13.2	0.2	B	7	0
yes	13.2	0.2	B	3	20
yes	14	1	B	7	3
yes	13.6	0.6	B	7	75
no	14.3	1.3	B	7	30
yes	13.2	0.2	C	7	0

yes	13.2	0.2	B	7	4
yes	13.2	0.2	B	3	3
no	21.4	8.4	A	7	12
yes	17.1	4.1	C	7	1
no	16.11	3.11	B	7	6
yes	13.4	0.4	B	7	6
no	22	9	B	7	10
yes	15	2	B	7	20
yes	18	5	B	7	3
yes	14.5	1.5	B	3	4
yes	13.4	0.4	C	7	30
no	15	2	A	7	1.5
yes	13.8	0.8	B	7	0
yes	15.8	2.8	C	3	10
yes	13.3	0.3	D	3	5
yes	15.2	2.2	C	7	21
yes	15	2	B	7	30
yes	13.5	0.5	B	7	2
no	16.11	3.11	B	7	6
yes	13.4	0.4	B	7	6
no	22	9	B	7	10
yes	15	2	B	7	20
yes	18	5	B	7	3
yes	14.5	1.5	B	3	4
yes	13.4	0.4	C	7	30
no	15	2	A	7	1.5
yes	13.8	0.8	B	7	0
yes	15.8	2.8	C	3	10
yes	13.3	0.3	D	3	5
yes	15.2	2.2	C	7	21
yes	15	2	B	7	30
yes	13.5	0.5	B	7	2

Play_Games_Hours	Use_Software-Hours	CSE1	CSE2	CSE3	CSE4	CSE5	CSE6	CSE7	CSE8	CSE9	CSE10	TM1
0	1	5	6	8	8	7	7	7	4	10	10	3
0	10	8	5	10	7	7	8	10	5	9	7	4
0	0	6	3	6	6	6	6	6	6	6	6	3
0	8	8	4	7	6	10	9	10	6	10	10	4
0	0	5	0	4	5	6	6	7	3	8	7	3
0	0	4	0	4	5	5	5	6	5	5	6	4
0	0	4	1	5	5	5	7	10	6	6	10	4
0	11	5	5	6	6	6	5	7	5	10	8	4
0	54	10	10	10	10	10	10	10	10	10	10	3
10	4	9	9	9	7	10	8	10	8	10	10	3
1	1	9	4	4	7	8	8	10	5	10	10	4
0	0	7	7	4	7	7	7	7	7	8	7	4
0	0	0	0	0	0	0	6	6	6	0	6	6	0
0	2	10	10	5	5	9	7	6	6	6	6	3
1	20	7	4	5	7	10	8	10	5	10	9	3
1	1.5	5	5	7	7	8	8	9	7	7	9	5
0	0	10	4	10	10	10	10	7	6	10	4	2
0	0	4	10	10	10	10	10	10	5	10	0	3
0	1	0	10	10	10	10	10	10	10	10	10	3
0	2	5	5	5	5	5	10	6	10	10	5	4
0	2	7	7	7	7	7	7	8	5	8	8	3
0	10	0	0	5	0	10	10	0	0	10	5	5
0	0	6	3	3	4	8	6	6	5	8	8	3
0	3	2	2	2	4	4	5	10	10	10	10	3
2	18	10	6	7	7	7	7	7	6	6	7	5
0	6	5	5	5	5	5	5	8	7	9	10	3
15	5	10	10	10	10	10	10	10	10	10	10	5
5	15	6	3	4	4	4	4	4	4	7	4	4
0	0	5	0	9	8	10	10	10	3	9	10	5
1	4	9	9	9	9	5	9	9	4	9	6	5
4	0	0	0	0	0	0	0	0	9	0	0	3
0	0	8	6	8	8	8	8	8	8	8	8	0
0	6	9	0	10	9	10	9	10	10	10	10	5
0	6	6	5	4	8	6	5	6	4	5	6	2
0	4	7	7	7	7	9	10	10	10	10	10	3
2	20	3	2	5	7	8	8	9	7	8	9	4
2	20	6	6	7	7	8	8	8	8	9	9	3
0	0	4	4	6	5	8	5	8	5	5	5	5
2	3	7	0	0	0	8	10	10	6	10	10	4
10	5	9	9	7	8	10	10	9	9	10	10	3
0.5	30	4	3	8	5	8	9	9	3	10	10	4

0	0	4	4	4	4	9	9	9	9	9	9	4
1	4	5	5	5	7	8	9	10	10	10	10	2
0	2	7	7	8	9	9	9	9	7	9	8	5
2	20	6	6	6	6	6	6	6	6	6	5	5
0	30	5	5	5	5	5	5	5	5	6	5	5
0	2	7	6	7	7	8	8	9	5	9	9	4
0	1	5	6	8	8	7	7	7	4	10	10	3
0	10	8	5	10	7	7	8	10	5	9	7	4
0	0	6	3	6	6	6	6	6	6	6	6	3
0	8	8	4	7	6	10	9	10	6	10	10	4
0	0	5	0	4	5	6	6	7	3	8	7	3
0	0	4	0	4	5	5	5	6	5	5	6	4
0	0	4	1	5	5	5	7	10	6	6	10	4
0	11	5	5	6	6	6	5	7	5	10	8	4
0	54	10	10	10	10	10	10	10	10	10	10	3
10	4	9	9	9	7	10	8	10	8	10	10	3
1	1	9	4	4	7	8	8	10	5	10	10	4
0	0	7	7	4	7	7	7	7	7	8	7	4
0	0	0	0	0	0	6	6	6	0	6	6	0
0	2	10	10	5	5	9	7	6	6	6	6	3
1	20	7	4	5	7	10	8	10	5	10	9	3
1	1.5	5	5	7	7	8	8	9	7	7	9	5
0	0	10	4	10	10	10	10	7	6	10	4	2
0	0	4	10	10	10	10	10	10	5	10	0	3
0	1	0	10	10	10	10	10	10	10	10	10	3
0	2	5	5	5	5	5	10	6	10	10	5	4
0	2	7	7	7	7	7	7	8	5	8	8	3
0	10	0	0	5	0	10	10	0	0	10	5	5
0	0	6	3	3	4	8	6	6	5	8	8	3
0	3	2	2	2	4	4	5	10	10	10	10	3
2	18	10	6	7	7	7	7	7	6	6	7	5
0	6	5	5	5	5	5	5	8	7	9	10	3
15	5	10	10	10	10	10	10	10	10	10	10	5
5	15	6	3	4	4	4	4	4	4	7	4	4
0	0	5	0	9	8	10	10	10	3	9	10	5
1	4	9	9	9	9	5	9	9	4	9	6	5
4	0	0	0	0	0	0	0	0	9	0	0	3
0	0	8	6	8	8	8	8	8	8	8	8	0
0	6	9	0	10	9	10	9	10	10	10	10	5
0	6	6	5	4	8	6	5	6	4	5	6	2
0	4	7	7	7	7	9	10	10	10	10	10	3
2	20	3	2	5	7	8	8	9	7	8	9	4
2	20	6	6	7	7	8	8	8	8	9	9	3

0	0	4	4	6	5	8	5	8	5	5	5	5
2	3	7	0	0	0	8	10	10	6	10	10	4
10	5	9	9	7	8	10	10	9	9	10	10	3
0.5	30	4	3	8	5	8	9	9	3	10	10	4
0	0	4	4	4	4	9	9	9	9	9	9	4
1	4	5	5	5	7	8	9	10	10	10	10	2
0	2	7	7	8	9	9	9	9	7	9	8	5
2	20	6	6	6	6	6	6	6	6	6	5	5
0	30	5	5	5	5	5	5	5	5	6	5	5
0	2	7	6	7	7	8	8	9	5	9	9	4
0	1	5	6	8	8	7	7	7	4	10	10	3
0	10	8	5	10	7	7	8	10	5	9	7	4
0	0	6	3	6	6	6	6	6	6	6	6	3
0	8	8	4	7	6	10	9	10	6	10	10	4
0	0	5	0	4	5	6	6	7	3	8	7	3
0	0	4	0	4	5	5	5	6	5	5	6	4
0	0	4	1	5	5	5	7	10	6	6	10	4
0	11	5	5	6	6	6	5	7	5	10	8	4
0	54	10	10	10	10	10	10	10	10	10	10	3
10	4	9	9	9	7	10	8	10	8	10	10	3
1	1	9	4	4	7	8	8	10	5	10	10	4
0	0	7	7	4	7	7	7	7	7	8	7	4
0	0	0	0	0	0	6	6	6	0	6	6	0
0	2	10	10	5	5	9	7	6	6	6	6	3
1	20	7	4	5	7	10	8	10	5	10	9	3
1	1.5	5	5	7	7	8	8	9	7	7	9	5
0	0	10	4	10	10	10	10	7	6	10	4	2
0	0	4	10	10	10	10	10	10	5	10	0	3
0	1	0	10	10	10	10	10	10	10	10	10	3
0	2	5	5	5	5	5	10	6	10	10	5	4
0	2	7	7	7	7	7	7	8	5	8	8	3
0	10	0	0	5	0	10	10	0	0	10	5	5
0	0	6	3	3	4	8	6	6	5	8	8	3
0	3	2	2	2	4	4	5	10	10	10	10	3
2	18	10	6	7	7	7	7	7	6	6	7	5
0	6	5	5	5	5	5	5	8	7	9	10	3
15	5	10	10	10	10	10	10	10	10	10	10	5
5	15	6	3	4	4	4	4	4	4	7	4	4
0	0	5	0	9	8	10	10	10	3	9	10	5
1	4	9	9	9	9	5	9	9	4	9	6	5
4	0	0	0	0	0	0	0	0	9	0	0	3
0	0	8	6	8	8	8	8	8	8	8	8	0
0	6	9	0	10	9	10	9	10	10	10	10	5

0	6	6	5	4	8	6	5	6	4	5	6	2
0	4	7	7	7	7	9	10	10	10	10	10	3
2	20	3	2	5	7	8	8	9	7	8	9	4
2	20	6	6	7	7	8	8	8	8	9	9	3
0	0	4	4	6	5	8	5	8	5	5	5	5
2	3	7	0	0	0	8	10	10	6	10	10	4
10	5	9	9	7	8	10	10	9	9	10	10	3
0.5	30	4	3	8	5	8	9	9	3	10	10	4
0	0	4	4	4	4	9	9	9	9	9	9	4
1	4	5	5	5	7	8	9	10	10	10	10	2
0	2	7	7	8	9	9	9	9	7	9	8	5
2	20	6	6	6	6	6	6	6	6	6	5	5
0	30	5	5	5	5	5	5	5	5	6	5	5
0	2	7	6	7	7	8	8	9	5	9	9	4
0	1	5	6	8	8	7	7	7	4	10	10	3
0	10	8	5	10	7	7	8	10	5	9	7	4
0	0	6	3	6	6	6	6	6	6	6	6	3
0	8	8	4	7	6	10	9	10	6	10	10	4
0	0	5	0	4	5	6	6	7	3	8	7	3
0	0	4	0	4	5	5	5	6	5	5	6	4
0	0	4	1	5	5	5	7	10	6	6	10	4
0	11	5	5	6	6	6	5	7	5	10	8	4
0	54	10	10	10	10	10	10	10	10	10	10	3
10	4	9	9	9	7	10	8	10	8	10	10	3
1	1	9	4	4	7	8	8	10	5	10	10	4
0	0	7	7	4	7	7	7	7	7	8	7	4
0	0	0	0	0	0	6	6	6	0	6	6	0
0	2	10	10	5	5	9	7	6	6	6	6	3
1	20	7	4	5	7	10	8	10	5	10	9	3
1	1.5	5	5	7	7	8	8	9	7	7	9	5
0	0	10	4	10	10	10	10	7	6	10	4	2
0	0	4	10	10	10	10	10	10	5	10	0	3
0	1	0	10	10	10	10	10	10	10	10	10	3
0	2	5	5	5	5	5	10	6	10	10	5	4
0	2	7	7	7	7	7	7	8	5	8	8	3
0	10	0	0	5	0	10	10	0	0	10	5	5
0	0	6	3	3	4	8	6	6	5	8	8	3
0	3	2	2	2	4	4	5	10	10	10	10	3
2	18	10	6	7	7	7	7	7	6	6	7	5
0	6	5	5	5	5	5	5	8	7	9	10	3
15	5	10	10	10	10	10	10	10	10	10	10	5
5	15	6	3	4	4	4	4	4	4	7	4	4
0	0	5	0	9	8	10	10	10	3	9	10	5

1	4	9	9	9	9	5	9	9	4	9	6	5
4	0	0	0	0	0	0	0	0	9	0	0	3
0	0	8	6	8	8	8	8	8	8	8	8	0
0	6	9	0	10	9	10	9	10	10	10	10	5
0	6	6	5	4	8	6	5	6	4	5	6	2
0	4	7	7	7	7	9	10	10	10	10	10	3
2	20	3	2	5	7	8	8	9	7	8	9	4
2	20	6	6	7	7	8	8	8	8	9	9	3
0	0	4	4	6	5	8	5	8	5	5	5	5
2	3	7	0	0	0	8	10	10	6	10	10	4
10	5	9	9	7	8	10	10	9	9	10	10	3
0.5	30	4	3	8	5	8	9	9	3	10	10	4
0	0	4	4	4	4	9	9	9	9	9	9	4
1	4	5	5	5	7	8	9	10	10	10	10	2
0	2	7	7	8	9	9	9	9	7	9	8	5
2	20	6	6	6	6	6	6	6	6	6	5	5
0	30	5	5	5	5	5	5	5	5	6	5	5
0	2	7	6	7	7	8	8	9	5	9	9	4
0	6	6	5	4	8	6	5	6	4	5	6	2
0	4	7	7	7	7	9	10	10	10	10	10	3
2	20	3	2	5	7	8	8	9	7	8	9	4
2	20	6	6	7	7	8	8	8	8	9	9	3
0	0	4	4	6	5	8	5	8	5	5	5	5
2	3	7	0	0	0	8	10	10	6	10	10	4
10	5	9	9	7	8	10	10	9	9	10	10	3
0.5	30	4	3	8	5	8	9	9	3	10	10	4
0	0	4	4	4	4	9	9	9	9	9	9	4
1	4	5	5	5	7	8	9	10	10	10	10	2
0	2	7	7	8	9	9	9	9	7	9	8	5
2	20	6	6	6	6	6	6	6	6	6	5	5
0	30	5	5	5	5	5	5	5	5	6	5	5
0	2	7	6	7	7	8	8	9	5	9	9	4

TM2	TM3	TM4	TM5	TM6	CM1	CM2	CM3	CM4	CM5	IF1	IF2	IF3	IF4	I1	I2	I3	I4	S1	S2	S3	S4	S5
4	5	3	4	3	3	3	3	3	4	5	5	5	5	5	5	2	2	5	4	3	5	5
4	4	3	5	5	3	3	4	4	4	5	3	4	5	4	3	3	3	5	4	3	1	1
3	4	2	4	5	4	4	4	4	5	5	5	5	5	5	4	4	4	5	4	4	5	4
4	3	4	4	4	3	5	4	3	4	4	4	2	4	5	2	3	4	4	4	2	2	2
2	3	4	3	3	2	3	3	2	3	3	4	3	3	1	3	3	4	3	4	2	3	3
4	3	4	4	4	4	4	4	4	4	4	4	3	4	3	4	3	4	4	4	3	4	4
5	4	3	2	4	4	4	5	4	5	5	4	5	5	5	5	4	4	4	4	4	4	4
4	5	3	4	5	5	5	5	5	5	5	5	5	5	4	3	5	5	5	5	5	5	5
4	3	4	5	5	5	5	5	5	5	5	5	3	5	4	3	4	4	5	5	4	1	5
3	3	4	3	3	4	4	4	4	4	4	4	4	5	4	4	4	4	5	5	5	5	5
3	2	3	4	3	4	5	5	5	5	4	3	2	4	3	3	4	4	4	4	2	2	3
5	5	5	5	5	5	5	5	4	4	5	5	4	5	5	4	5	5	4	5	4	5	5
3	3	3	4	5	5	4	4	4	4	5	5	5	5	5	4	4	4	5	5	4	5	4
4	3	3	4	5	5	5	4	4	4	5	3	3	4	4	4	3	4	4	5	5	5	5
3	4	3	4	4	4	4	4	4	4	5	4	5	4	2	1	3	3	4	3	3	5	4
5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5
2	3	1	4	5	5	1	1	1	5	5	5	1	5	3	5	5	5	5	5	5	5	5
3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	5	5	3	4	3	3	5	5
4	2	3	2	3	3	4	4	3	3	3	3	2	4	4	4	4	3	4	4	4	4	4
3	3	3	3	4	4	3	3	3	4	4	4	4	4	4	4	4	3	4	3	4	4	5
4	3	3	4	4	4	4	4	3	3	4	4	2	4	3	3	4	3	4	3	4	5	4
5	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
3	3	2	4	3	3	3	3	3	3	5	5	3	4	4	3	3	3	5	4	3	3	3
3	3	4	3	4	5	5	5	5	5	5	5	2	5	3	3	5	5	5	5	5	5	5
4	4	4	4	5	4	4	4	4	4	5	5	3	5	5	5	5	5	5	4	4	5	5
3	3	3	3	4	4	4	4	4	3	3	3	3	3	3	4	4	4	4	4	3	4	4
5	5	5	3	5	5	5	5	5	5	5	4	5	5	3	3	4	4	5	5	5	5	5
4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	5	3	3	4	4
5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5
4	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	3	3	5	4	4
5	5	5	4	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
4	0	4	4	4	4	4	4	4	4	4	5	5	5	1	2	4	4	5	4	4	4	4
5	3	5	5	5	5	5	5	5	5	5	5	1	5	4	5	5	5	5	3	3	5	4
1	5	4	5	5	5	5	5	5	5	5	5	2	5	4	4	4	5	5	4	2	4	1
4	4	3	3	4	4	4	4	4	3	4	3	4	5	4	3	3	3	5	4	4	3	4
3	3	3	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4
3	3	3	3	4	4	4	4	4	3	3	3	4	4	4	3	3	4	4	2	2	2	3
4	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	5	4	3	4	3
2	4	3	5	3	5	5	3	3	5	5	3	2	5	3	3	5	3	5	5	1	5	5
2	4	3	4	4	5	5	5	5	5	5	5	5	5	4	4	4	4	5	4	5	4	5
4	1	3	2	4	4	5	5	4	3	4	5	1	5	4	5	4	3	5	5	4	4	1

3	2	3	4	4	5	4	4	4	5	4	3	1	4	1	1	1	4	5	4	1	4	4
3	3	3	3	3	4	4	3	3	4	4	3	2	4	3	3	3	3	3	3	3	3	3
4	2	4	4	5	5	5	5	5	5	4	5	4	5	4	5	5	4	5	5	5	5	4
5	5	5	5	5	3	4	4	4	4	4	5	3	5	4	5	4	4	5	5	5	5	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
5	4	5	4	5	5	5	5	5	5	4	5	4	4	4	2	3	3	5	5	5	5	5
4	5	3	4	3	3	3	3	3	4	5	5	5	5	5	5	2	2	5	4	3	5	5
4	4	3	5	5	3	3	4	4	4	5	3	4	5	4	3	3	3	5	4	3	1	1
3	4	2	4	5	4	4	4	4	5	5	5	5	5	5	4	4	4	5	4	4	5	4
4	3	4	4	4	3	5	4	3	4	4	4	2	4	5	2	3	4	4	4	2	2	2
2	3	4	3	3	2	3	3	2	3	3	4	3	3	1	3	3	4	3	4	2	3	3
4	3	4	4	4	4	4	4	4	4	4	4	3	4	3	4	3	4	4	4	3	4	4
5	4	3	2	4	4	4	5	4	5	5	4	5	5	5	5	4	4	4	4	4	4	4
4	5	3	4	5	5	5	5	5	5	5	5	5	5	4	3	5	5	5	5	5	5	5
4	3	4	5	5	5	5	5	5	5	5	5	3	5	4	3	4	4	5	5	4	1	5
3	3	4	3	3	4	4	4	4	4	4	4	4	5	4	4	4	4	5	5	5	5	5
3	2	3	4	3	4	5	5	5	5	4	3	2	4	3	3	4	4	4	4	2	2	3
5	5	5	5	5	5	5	5	4	4	5	5	4	5	5	4	5	5	4	5	4	5	5
3	3	3	4	5	5	4	4	4	4	5	5	5	5	5	4	4	4	5	5	4	5	4
4	3	3	4	5	5	5	4	4	4	5	3	3	4	4	4	3	4	4	5	5	5	5
3	4	3	4	4	4	4	4	4	4	5	4	5	4	2	1	3	3	4	3	3	5	4
5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5
2	3	1	4	5	5	1	1	1	5	5	5	1	5	3	5	5	5	5	5	5	5	5
3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	5	5	3	4	3	3	5	5
4	2	3	2	3	3	4	4	3	3	3	3	2	4	4	4	4	3	4	4	4	4	4
3	3	3	3	4	4	3	3	3	4	4	4	4	4	4	4	4	3	4	3	4	4	5
4	3	3	4	4	4	4	4	3	3	4	4	2	4	3	3	4	3	4	3	4	5	4
5	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
3	3	2	4	3	3	3	3	3	3	5	5	3	4	4	3	3	3	5	4	3	3	3
3	3	4	3	4	5	5	5	5	5	5	5	2	5	3	3	5	5	5	5	5	5	5
4	4	4	4	5	4	4	4	4	4	5	5	3	5	5	5	5	5	5	4	4	5	5
3	3	3	3	4	4	4	4	4	3	3	3	3	3	3	4	4	4	4	4	3	4	4
5	5	5	3	5	5	5	5	5	5	5	4	5	5	3	3	4	4	5	5	5	5	5
4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	5	3	3	4	4
5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5
4	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	3	3	5	4	4
5	5	5	4	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
4	0	4	4	4	4	4	4	4	4	4	5	5	5	1	2	4	4	5	4	4	4	4
5	3	5	5	5	5	5	5	5	5	5	5	1	5	4	5	5	5	5	3	3	5	4
1	5	4	5	5	5	5	5	5	5	5	5	2	5	4	4	4	5	5	4	2	4	1
4	4	3	3	4	4	4	4	4	3	4	3	4	5	4	3	3	3	5	4	4	3	4
3	3	3	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4
3	3	3	3	4	4	4	4	4	3	3	3	4	4	4	3	3	4	4	2	2	2	3

4	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	5	4	3	4	3
2	4	3	5	3	5	5	3	3	5	5	3	2	5	3	3	5	3	5	5	1	5	5
2	4	3	4	4	5	5	5	5	5	5	5	5	5	4	4	4	4	5	4	5	4	5
4	1	3	2	4	4	5	5	4	3	4	5	1	5	4	5	4	3	5	5	4	4	1
3	2	3	4	4	5	4	4	4	5	4	3	1	4	1	1	1	4	5	4	1	4	4
3	3	3	3	3	4	4	3	3	4	4	3	2	4	3	3	3	3	3	3	3	3	3
4	2	4	4	5	5	5	5	5	5	4	5	4	5	4	5	5	4	5	5	5	5	4
5	5	5	5	5	3	4	4	4	4	4	5	3	5	4	5	4	4	5	5	5	5	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
5	4	5	4	5	5	5	5	5	5	4	5	4	4	4	2	3	3	5	5	5	5	5
4	5	3	4	3	3	3	3	3	4	5	5	5	5	5	5	2	2	5	4	3	5	5
4	4	3	5	5	3	3	4	4	4	5	3	4	5	4	3	3	3	5	4	3	1	1
3	4	2	4	5	4	4	4	4	5	5	5	5	5	5	4	4	4	5	4	4	5	4
4	3	4	4	4	3	5	4	3	4	4	4	2	4	5	2	3	4	4	4	2	2	2
2	3	4	3	3	2	3	3	2	3	3	4	3	3	1	3	3	4	3	4	2	3	3
4	3	4	4	4	4	4	4	4	4	4	4	3	4	3	4	3	4	4	4	3	4	4
5	4	3	2	4	4	4	5	4	5	5	4	5	5	5	5	4	4	4	4	4	4	4
4	5	3	4	5	5	5	5	5	5	5	5	5	5	5	4	3	5	5	5	5	5	5
4	3	4	5	5	5	5	5	5	5	5	5	3	5	4	3	4	4	5	5	4	1	5
3	3	4	3	3	4	4	4	4	4	4	4	4	5	4	4	4	4	5	5	5	5	5
3	2	3	4	3	4	5	5	5	5	4	3	2	4	3	3	4	4	4	4	2	2	3
5	5	5	5	5	5	5	5	4	4	5	5	4	5	5	4	5	5	4	5	4	5	5
3	3	3	4	5	5	4	4	4	4	5	5	5	5	5	4	4	4	5	5	4	5	4
4	3	3	4	5	5	5	4	4	4	5	3	3	4	4	4	3	4	4	5	5	5	5
3	4	3	4	4	4	4	4	4	4	5	4	5	4	2	1	3	3	4	3	3	5	4
5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5
2	3	1	4	5	5	1	1	1	5	5	5	1	5	3	5	5	5	5	5	5	5	5
3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	5	5	3	4	3	3	5	5
4	2	3	2	3	3	4	4	3	3	3	3	2	4	4	4	4	3	4	4	4	4	4
3	3	3	3	4	4	3	3	3	4	4	4	4	4	4	4	4	3	4	3	4	4	5
4	3	3	4	4	4	4	4	3	3	4	4	2	4	3	3	4	3	4	3	4	5	4
5	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
3	3	2	4	3	3	3	3	3	3	5	5	3	4	4	3	3	3	5	4	3	3	3
3	3	4	3	4	5	5	5	5	5	5	5	2	5	3	3	5	5	5	5	5	5	5
4	4	4	4	5	4	4	4	4	4	5	5	3	5	5	5	5	5	5	4	4	5	5
3	3	3	3	4	4	4	4	4	3	3	3	3	3	3	4	4	4	4	4	3	4	4
5	5	5	3	5	5	5	5	5	5	5	4	5	5	3	3	4	4	5	5	5	5	5
4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	5	3	3	4	4
5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5
4	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	3	3	5	4	4
5	5	5	4	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
4	0	4	4	4	4	4	4	4	4	4	5	5	5	1	2	4	4	5	4	4	4	4
5	3	5	5	5	5	5	5	5	5	5	5	1	5	4	5	5	5	5	3	3	5	4

1	5	4	5	5	5	5	5	5	5	5	5	2	5	4	4	4	5	5	4	2	4	1
4	4	3	3	4	4	4	4	4	3	4	3	4	5	4	3	3	3	5	4	4	3	4
3	3	3	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4
3	3	3	3	4	4	4	4	4	3	3	3	4	4	4	3	3	4	4	2	2	2	3
4	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	5	4	3	4	3
2	4	3	5	3	5	5	3	3	5	5	3	2	5	3	3	5	3	5	5	1	5	5
2	4	3	4	4	5	5	5	5	5	5	5	5	5	4	4	4	4	5	4	5	4	5
4	1	3	2	4	4	5	5	4	3	4	5	1	5	4	5	4	3	5	5	4	4	1
3	2	3	4	4	5	4	4	4	5	4	3	1	4	1	1	1	4	5	4	1	4	4
3	3	3	3	3	4	4	3	3	4	4	3	2	4	3	3	3	3	3	3	3	3	3
4	2	4	4	5	5	5	5	5	5	4	5	4	5	4	5	5	4	5	5	5	5	4
5	5	5	5	5	3	4	4	4	4	4	5	3	5	4	5	4	4	5	5	5	5	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
5	4	5	4	5	5	5	5	5	5	4	5	4	4	4	2	3	3	5	5	5	5	5
4	5	3	4	3	3	3	3	3	4	5	5	5	5	5	5	2	2	5	4	3	5	5
4	4	3	5	5	3	3	4	4	4	5	3	4	5	4	3	3	3	5	4	3	1	1
3	4	2	4	5	4	4	4	4	5	5	5	5	5	5	4	4	4	5	4	4	5	4
4	3	4	4	4	3	5	4	3	4	4	4	2	4	5	2	3	4	4	4	2	2	2
2	3	4	3	3	2	3	3	2	3	3	4	3	3	1	3	3	4	3	4	2	3	3
4	3	4	4	4	4	4	4	4	4	4	4	4	3	4	3	4	3	4	4	4	3	4	4
5	4	3	2	4	4	4	5	4	5	5	4	5	5	5	5	4	4	4	4	4	4	4
4	5	3	4	5	5	5	5	5	5	5	5	5	5	5	4	3	5	5	5	5	5	5
4	3	4	5	5	5	5	5	5	5	5	5	3	5	4	3	4	4	5	5	4	1	5
3	3	4	3	3	4	4	4	4	4	4	4	4	5	4	4	4	4	5	5	5	5	5
3	2	3	4	3	4	5	5	5	5	4	3	2	4	3	3	4	4	4	4	2	2	3
5	5	5	5	5	5	5	5	4	4	5	5	4	5	5	4	5	5	4	5	4	5	5
3	3	3	4	5	5	4	4	4	4	5	5	5	5	5	4	4	4	5	5	4	5	4
4	3	3	4	5	5	5	4	4	4	5	3	3	4	4	4	3	4	4	5	5	5	5
3	4	3	4	4	4	4	4	4	4	5	4	5	4	2	1	3	3	4	3	3	5	4
5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5
2	3	1	4	5	5	1	1	1	5	5	5	1	5	3	5	5	5	5	5	5	5	5
3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	5	5	3	4	3	3	5	5
4	2	3	2	3	3	4	4	3	3	3	3	2	4	4	4	4	3	4	4	4	4	4
3	3	3	3	4	4	3	3	3	4	4	4	4	4	4	4	4	3	4	3	4	4	5
4	3	3	4	4	4	4	4	3	3	4	4	2	4	3	3	4	3	4	3	4	5	4
5	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
3	3	2	4	3	3	3	3	3	3	5	5	3	4	4	3	3	3	5	4	3	3	3
3	3	4	3	4	5	5	5	5	5	5	5	2	5	3	3	5	5	5	5	5	5	5
4	4	4	4	5	4	4	4	4	4	5	5	3	5	5	5	5	5	5	4	4	5	5
3	3	3	3	4	4	4	4	4	3	3	3	3	3	3	4	4	4	4	4	3	4	4
5	5	5	3	5	5	5	5	5	5	5	4	5	5	3	3	4	4	5	5	5	5	5
4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	5	3	3	4	4
5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5

4	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	3	3	5	4	4
5	5	5	4	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
4	0	4	4	4	4	4	4	4	4	4	5	5	5	1	2	4	4	5	4	4	4	4
5	3	5	5	5	5	5	5	5	5	5	5	1	5	4	5	5	5	5	3	3	5	4
1	5	4	5	5	5	5	5	5	5	5	5	2	5	4	4	4	5	5	4	2	4	1
4	4	3	3	4	4	4	4	4	3	4	3	4	5	4	3	3	3	5	4	4	3	4
3	3	3	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4
3	3	3	3	4	4	4	4	4	3	3	3	4	4	4	3	3	4	4	2	2	2	3
4	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	5	4	3	4	3
2	4	3	5	3	5	5	3	3	5	5	3	2	5	3	3	5	3	5	5	1	5	5
2	4	3	4	4	5	5	5	5	5	5	5	5	5	4	4	4	4	5	4	5	4	5
4	1	3	2	4	4	5	5	4	3	4	5	1	5	4	5	4	3	5	5	4	4	1
3	2	3	4	4	5	4	4	4	5	4	3	1	4	1	1	1	4	5	4	1	4	4
3	3	3	3	3	4	4	3	3	4	4	3	2	4	3	3	3	3	3	3	3	3	3
4	2	4	4	5	5	5	5	5	5	4	5	4	5	4	5	5	4	5	5	5	5	4
5	5	5	5	5	3	4	4	4	4	4	5	3	5	4	5	4	4	5	5	5	5	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
5	4	5	4	5	5	5	5	5	5	4	5	4	4	4	2	3	3	5	5	5	5	5
1	5	4	5	5	5	5	5	5	5	5	5	2	5	4	4	4	5	5	4	2	4	1
4	4	3	3	4	4	4	4	4	3	4	3	4	5	4	3	3	3	5	4	4	3	4
3	3	3	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	3	4	4
3	3	3	3	4	4	4	4	4	3	3	3	4	4	4	3	3	4	4	2	2	2	3
4	5	5	5	5	5	5	5	5	5	5	5	4	5	4	4	5	4	5	4	3	4	3
2	4	3	5	3	5	5	3	3	5	5	3	2	5	3	3	5	3	5	5	1	5	5
2	4	3	4	4	5	5	5	5	5	5	5	5	5	4	4	4	4	5	4	5	4	5
4	1	3	2	4	4	5	5	4	3	4	5	1	5	4	5	4	3	5	5	4	4	1
3	2	3	4	4	5	4	4	4	5	4	3	1	4	1	1	1	4	5	4	1	4	4
3	3	3	3	3	4	4	3	3	4	4	3	2	4	3	3	3	3	3	3	3	3	3
4	2	4	4	5	5	5	5	5	5	4	5	4	5	4	5	5	4	5	5	5	5	4
5	5	5	5	5	3	4	4	4	4	4	5	3	5	4	5	4	4	5	5	5	5	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
5	4	5	4	5	5	5	5	5	5	4	5	4	4	4	2	3	3	5	5	5	5	5

4	4	4	4	2	4	4	5	6	5	2	1	1	5	1	1	6	2	5
3	3	3	3	3	3	3	4	4	6	1	1	1	4	1	1	4	4	2
5	4	4	4	4	5	5	5	5	5	1	1	1	5	1	1	5	5	2
5	3	4	4	4	4	4	4	2	6	3	1	3	5	1	1	5	4	3
5	5	5	5	5		5	5	5	5	1	1	1	6	1	1	6	4	1
5	5	4	4	5	5	4	5	5	6	1	1	1	6	1	1	6	5	1
5	3	4	3	4	4	4	6	6	6	1	1	1	5	1	1	5	5	1
5	3	5	5	5	5	5	6	6	6	6	3	1	6	1	1	6	6	1
5	5	5	5	5	5	5	4	4	6	2	1	1	3	1	1	2	4	2
3	1	2	3	4	3	2	5	4	5	4	2	1	4	2	1	3	3	3
4	2	3	3	3	2	2	3	3	6	2	2	4	3	2	1	3	3	3
4	4	4	4	4	4	3	3	4	5	2	2	1	4	1	1	3	3	2
4	4	4	3	4	4	4	4	5	5	4	5	5	4	2	2	4	4	2
5	5	5	5	5	5	5	6	6	6	1	2	1	6	1	1	6	6	1
5	5	5	3	5	4	5	6	6	6	1	4	1	6	1	1	6	6	1
5	4	4	3	4	5	5	5	5	6	1	1	1	6	1	1	6	6	1
4	4	3	3	3	4	4	5	5	5	2	1	1	4	1	1	5	5	1
5	5	5	5	5	5	5	6	6	6	1	1	1	6	1	1	6	6	1
5	5	4	4	4	5	5	4	4	5	4	2	1	6	1	1	4	5	1
5	5	5	3	4	5	5	1	1	4	2	3	3	3	3	1	3	2	6
4	4	4	3	5	5	4	4	6	6	1	2	1	4	1	1	5	5	1
5	5	5	5	5	5	5	6	6	6	1	1	1	6	1	1	6	6	1
5	5	5	5	5	5	5	6	6	6	1	1	1	6	1	1	6	6	6
5	4	4	5	5	5	5	6	1	6	6	1	6	3	1	1	3	1	6
4	4	3	2	3	2	4	6	5	6	2	3	2	5	1	1	5	5	2
5	4	5	5	5	5	5	3	3	6	3	1	2	2	1	1	2	3	2
5	4	4	4	3	4	4	5	5	6	1	1	1	6	2	1	5	5	1
5	5	5	5	5	5	5	5	5	6	1	1	1	6	1	1	6	5	1
3	4	3	3	2	2	3	3	3	4	2	1	2	3	1	1	5	3	1
5	5	5	3	4	5	5	5	4	6	2	1	2	2	1	1	5	4	4
5	5	5	5	5	5	5	5	5	6	1	1	1	3	1	1	4	5	4
4	3	3	4	4	3	5	3	3	5	2	3	3	3	1	1	5	5	4
5	5	5	5	3	3	3	6	6	6	1	1	1	6	1	1	6	6	6
5	3	3	4	4	4	4	3	5	6	4	4	1	6	6	1	6	5	4
5	5	5	5	4	3	3	4	4	5	3	1	6	6	6	1	5	5	3
5	3	5	5	5	5	5	1	1	1	1	1	1	6	1	1	6	6	1
5	1	5	5	2	5	5	4	1	6	1	1	4	5	1	1	5	6	2
4	4	2	4	4	4	4	6	6	6	1	1	1	6	1	1	6	6	1
5	5	5	5	5	5	5	5	5	6	1	1	1	6	6	1	6	6	1
5	4	4	4	4	4	4	6	6	6	1	1	1	6	3	6	5	6	1
5	3	3	3	4	3	4	5	6	6	3	5	1	5	1	1	5	5	2
4	4	4	4	4	4	5	5	4	6	2	1	2	4	1	1	6	4	4
4	2	3	4	3	3	3	5	4	5	2	1	1	4	1	1	6	4	2

5	4	4	4	4	4	4	6	6	6	1	1	1	6	3	6	5	6	1
5	3	3	3	4	3	4	5	6	6	3	5	1	5	1	1	5	5	2
4	4	4	4	4	4	5	5	4	6	2	1	2	4	1	1	6	4	4
4	2	3	4	3	3	3	5	4	5	2	1	1	4	1	1	6	4	2
5	5	4	5	4	4	4	4	5	5	1	1	1	4	1	1	5	5	5
5	3	3	5	5	5	3	5	4	6	6	1	2	5	1	1	3	6	4
5	4	4	4	4	4	4	6	6	6	1	2	1	6	1	1	6	6	1
5	4	4	4	5	4	3	1	4	5	1	3	1	5	1	1	6	6	2
4	4	4	4	2	4	4	5	6	5	2	1	1	5	1	1	6	2	5
3	3	3	3	3	3	3	4	4	6	1	1	1	4	1	1	4	4	2
5	4	4	4	4	5	5	5	5	5	1	1	1	5	1	1	5	5	2
5	3	4	4	4	4	4	4	2	6	3	1	3	5	1	1	5	4	3
5	5	5	5	5		5	5	5	5	1	1	1	6	1	1	6	4	1
5	5	4	4	5	5	4	5	5	6	1	1	1	6	1	1	6	5	1
5	3	4	3	4	4	4	6	6	6	1	1	1	5	1	1	5	5	1
5	3	5	5	5	5	5	6	6	6	6	3	1	6	1	1	6	6	1
5	5	5	5	5	5	5	4	4	6	2	1	1	3	1	1	2	4	2
3	1	2	3	4	3	2	5	4	5	4	2	1	4	2	1	3	3	3
4	2	3	3	3	2	2	3	3	6	2	2	4	3	2	1	3	3	3
4	4	4	4	4	4	3	3	4	5	2	2	1	4	1	1	3	3	2
4	4	4	3	4	4	4	4	5	5	4	5	5	4	2	2	4	4	2
5	5	5	5	5	5	5	6	6	6	1	2	1	6	1	1	6	6	1
5	5	5	3	5	4	5	6	6	6	1	4	1	6	1	1	6	6	1
5	4	4	3	4	5	5	5	5	6	1	1	1	6	1	1	6	6	1
4	4	3	3	3	4	4	5	5	5	2	1	1	4	1	1	5	5	1
5	5	5	5	5	5	5	6	6	6	1	1	1	6	1	1	6	6	1
5	5	4	4	4	5	5	4	4	5	4	2	1	6	1	1	4	5	1
5	5	5	3	4	5	5	1	1	4	2	3	3	3	3	1	3	2	6
4	4	4	3	5	5	4	4	6	6	1	2	1	4	1	1	5	5	1
5	5	5	5	5	5	5	6	6	6	1	1	1	6	1	1	6	6	1
5	5	5	5	5	5	5	6	6	6	1	1	1	6	1	1	6	6	6
5	4	4	5	5	5	5	6	1	6	6	1	6	3	1	1	3	1	6
4	4	3	2	3	2	4	6	5	6	2	3	2	5	1	1	5	5	2
5	4	5	5	5	5	5	3	3	6	3	1	2	2	1	1	2	3	2
5	4	4	4	3	4	4	5	5	6	1	1	1	6	2	1	5	5	1
5	5	5	5	5	5	5	5	5	6	1	1	1	6	1	1	6	5	1
3	4	3	3	2	2	3	3	3	4	2	1	2	3	1	1	5	3	1
5	5	5	3	4	5	5	5	4	6	2	1	2	2	1	1	5	4	4
5	5	5	5	5	5	5	5	5	6	1	1	1	3	1	1	4	5	4
4	3	3	4	4	3	5	3	3	5	2	3	3	3	1	1	5	5	4
5	5	5	5	3	3	3	6	6	6	1	1	1	6	1	1	6	6	6
5	3	3	4	4	4	4	3	5	6	4	4	1	6	6	1	6	5	4
5	5	5	5	4	3	3	4	4	5	3	1	6	6	6	1	5	5	3

5	3	5	5	5	5	5	1	1	1	1	1	1	6	1	1	6	6	1
5	1	5	5	2	5	5	4	1	6	1	1	4	5	1	1	5	6	2
4	4	2	4	4	4	4	6	6	6	1	1	1	6	1	1	6	6	1
5	5	5	5	5	5	5	5	5	6	1	1	1	6	6	1	6	6	1
5	4	4	4	4	4	4	6	6	6	1	1	1	6	3	6	5	6	1
5	3	3	3	4	3	4	5	6	6	3	5	1	5	1	1	5	5	2
4	4	4	4	4	4	5	5	4	6	2	1	2	4	1	1	6	4	4
4	2	3	4	3	3	3	5	4	5	2	1	1	4	1	1	6	4	2
5	5	4	5	4	4	4	4	5	5	1	1	1	4	1	1	5	5	5
5	3	3	5	5	5	3	5	4	6	6	1	2	5	1	1	3	6	4
5	4	4	4	4	4	4	6	6	6	1	2	1	6	1	1	6	6	1
5	4	4	4	5	4	3	1	4	5	1	3	1	5	1	1	6	6	2
4	4	4	4	2	4	4	5	6	5	2	1	1	5	1	1	6	2	5
3	3	3	3	3	3	3	4	4	6	1	1	1	4	1	1	4	4	2
5	4	4	4	4	5	5	5	5	5	1	1	1	5	1	1	5	5	2
5	3	4	4	4	4	4	4	2	6	3	1	3	5	1	1	5	4	3
5	5	5	5	5		5	5	5	5	1	1	1	6	1	1	6	4	1
5	5	4	4	5	5	4	5	5	6	1	1	1	6	1	1	6	5	1
5	4	4	4	4	4	4	6	6	6	1	1	1	6	3	6	5	6	1
5	3	3	3	4	3	4	5	6	6	3	5	1	5	1	1	5	5	2
4	4	4	4	4	4	5	5	4	6	2	1	2	4	1	1	6	4	4
4	2	3	4	3	3	3	5	4	5	2	1	1	4	1	1	6	4	2
5	5	4	5	4	4	4	4	5	5	1	1	1	4	1	1	5	5	5
5	3	3	5	5	5	3	5	4	6	6	1	2	5	1	1	3	6	4
5	4	4	4	4	4	4	6	6	6	1	2	1	6	1	1	6	6	1
5	4	4	4	5	4	3	1	4	5	1	3	1	5	1	1	6	6	2
4	4	4	4	2	4	4	5	6	5	2	1	1	5	1	1	6	2	5
3	3	3	3	3	3	3	4	4	6	1	1	1	4	1	1	4	4	2
5	4	4	4	4	5	5	5	5	5	1	1	1	5	1	1	5	5	2
5	3	4	4	4	4	4	4	2	6	3	1	3	5	1	1	5	4	3
5	5	5	5	5		5	5	5	5	1	1	1	6	1	1	6	4	1
5	5	4	4	5	5	4	5	5	6	1	1	1	6	1	1	6	5	1

PCS13	PCS14	PCS15	PCS16	PCS17	PCS18	PCS19	PCS20	PCS21	PCS22	PCS23	PCS24	PCS25	PCS26
1	1	1	1	5	1	5	1	1	1	1	6	1	6
1	3	2	1	3	2	6	1	1	6	1	3	3	5
2	1	1	1	5	1	4	3	2	2	1	3	4	6
2	3	2	1	6	2	2	4	2	5	2	3	2	5
4	5	2	4	3	2	4	4	3	3	3	2	5	3
2	2	2	1	4	2	5	4	2	4	3	4	1	5
6	3	3	6	6	6	2	6	4	6	6	2	5	4
1	1	3	1	2	1	6	2	1	1	1	4	1	6
1	4	3	1	4	1	6	4	1	2	1	1	1	6
1	1	4	1	1	1	6	1	1	2	1	1	1	6
2	3	3	1	1	1	5	1	1	3	2	6	1	6
1	1	6	1	6	1	6	6	1	1	1	1	6	6
1	1	2	1	2	1	6	1	1	1	1	1	1	6
5	6	4	1	5	5	5	3	5	6	5	5	4	5
1	1	2	2	1	1	5	1	1	1	1	6	1	6
1	1	6	1	1	1	6	1	1	1	1	6	1	6
6	1	1	6	6	6	6	1	1	6	6	6	1	1
6	1	6	6	1	6	6	1	3	6	3	1	3	6
2	4	3	2	5	2	5	4	2	4	1	4	3	6
5	6	1	1	1	5	5	4	4	4	4	4	4	4
2	1	4	1	1	1	6	1	1	2	1	6	1	6
	1	1	1	6	1	3	1	1	1	1	1	1	6
3	1	3	2	6	1	4	1	1	6	3	6	1	6
4	1	1	1	1	3	2	1	3	5	1	1	3	1
4	1	1	1	1	1	1	3	1	2	1	2	6	6
3	3	5	2	6	3	3	1	3	4	3	6	3	6
1	6	3	1	6	1	6	6	1	1	1	6	1	6
4	3	5	4	5	4	4	5	4	5	5	5	4	3
4	1	1	1	2	4	4	2	4	2	4	3	1	6
3	1	4	1	3	3	6	1	4	4	4	3	5	6
4	1	4	1	2	1	1	1	2	2	3	6	2	1
3	1	4	1	3	1	6	1	4	4	2	1	2	5
1	1	1	1	1	1	6	1	1	1	1	1	1	6
1	1	3	1	1	1	5	1	1	4	1	6	1	6
2	3	3	1	3	2	5	4	2	3	2	3	1	4
5	1	4	1	1	2	5	1	2	5	3	6	2	6
2	2	4	1	1	1	5	1	1	1	1	4	1	5
3	1	1	1	3	1	5	1	1	1	1	4	1	6
6	3	2	1	2	1	5	4	5	5	2	3	4	3
2	6	2	1	1	1	6	1	1	1	1	6	1	6
4	5	1	1	4	1	5	5	2	2	2	5	1	6

3	1	4	1	1	1	6	1	1	3	1	1	1	6
2	1	4	1	2	2	5	1	3	3	2	1	4	6
2	1	4	1	3	2	6	2	2	2	1	2	2	1
3	2	3	1	3	3	6	3	4	3	4	3	1	6
3	1	1	1	1	1	6	1	1	4	1	1	1	1
2	1	3	1	1	1	6	1	1	4	1	6	1	6
1	1	1	1	5	1	5	1	1	1	1	6	1	6
1	3	2	1	3	2	6	1	1	6	1	3	3	5
2	1	1	1	5	1	4	3	2	2	1	3	4	6
2	3	2	1	6	2	2	4	2	5	2	3	2	5
4	5	2	4	3	2	4	4	3	3	3	2	5	3
2	2	2	1	4	2	5	4	2	4	3	4	1	5
6	3	3	6	6	6	2	6	4	6	6	2	5	4
1	1	3	1	2	1	6	2	1	1	1	4	1	6
1	4	3	1	4	1	6	4	1	2	1	1	1	6
1	1	4	1	1	1	6	1	1	2	1	1	1	6
2	3	3	1	1	1	5	1	1	3	2	6	1	6
1	1	6	1	6	1	6	6	1	1	1	1	6	6
1	1	2	1	2	1	6	1	1	1	1	1	1	6
5	6	4	1	5	5	5	3	5	6	5	5	4	5
1	1	2	2	1	1	5	1	1	1	1	6	1	6
1	1	6	1	1	1	6	1	1	1	1	6	1	6
6	1	1	6	6	6	6	1	1	6	6	6	1	1
6	1	6	6	1	6	6	1	3	6	3	1	3	6
2	4	3	2	5	2	5	4	2	4	1	4	3	6
5	6	1	1	1	5	5	4	4	4	4	4	4	4
2	1	4	1	1	1	6	1	1	2	1	6	1	6
	1	1	1	6	1	3	1	1	1	1	1	1	6
3	1	3	2	6	1	4	1	1	6	3	6	1	6
4	1	1	1	1	3	2	1	3	5	1	1	3	1
4	1	1	1	1	1	1	3	1	2	1	2	6	6
3	3	5	2	6	3	3	1	3	4	3	6	3	6
1	6	3	1	6	1	6	6	1	1	1	6	1	6
4	3	5	4	5	4	4	5	4	5	5	5	4	3
4	1	1	1	2	4	4	2	4	2	4	3	1	6
3	1	4	1	3	3	6	1	4	4	4	3	5	6
4	1	4	1	2	1	1	1	2	2	3	6	2	1
3	1	4	1	3	1	6	1	4	4	2	1	2	5
1	1	1	1	1	1	6	1	1	1	1	1	1	6
1	1	3	1	1	1	5	1	1	4	1	6	1	6
2	3	3	1	3	2	5	4	2	3	2	3	1	4
5	1	4	1	1	2	5	1	2	5	3	6	2	6
2	2	4	1	1	1	5	1	1	1	1	4	1	5

3	1	1	1	3	1	5	1	1	1	1	4	1	6
6	3	2	1	2	1	5	4	5	5	2	3	4	3
2	6	2	1	1	1	6	1	1	1	1	6	1	6
4	5	1	1	4	1	5	5	2	2	2	5	1	6
3	1	4	1	1	1	6	1	1	3	1	1	1	6
2	1	4	1	2	2	5	1	3	3	2	1	4	6
2	1	4	1	3	2	6	2	2	2	1	2	2	1
3	2	3	1	3	3	6	3	4	3	4	3	1	6
3	1	1	1	1	1	6	1	1	4	1	1	1	1
2	1	3	1	1	1	6	1	1	4	1	6	1	6
1	1	1	1	5	1	5	1	1	1	1	6	1	6
1	3	2	1	3	2	6	1	1	6	1	3	3	5
2	1	1	1	5	1	4	3	2	2	1	3	4	6
2	3	2	1	6	2	2	4	2	5	2	3	2	5
4	5	2	4	3	2	4	4	3	3	3	2	5	3
2	2	2	1	4	2	5	4	2	4	3	4	1	5
6	3	3	6	6	6	2	6	4	6	6	2	5	4
1	1	3	1	2	1	6	2	1	1	1	4	1	6
1	4	3	1	4	1	6	4	1	2	1	1	1	6
1	1	4	1	1	1	6	1	1	2	1	1	1	6
2	3	3	1	1	1	5	1	1	3	2	6	1	6
1	1	6	1	6	1	6	6	1	1	1	1	6	6
1	1	2	1	2	1	6	1	1	1	1	1	1	6
5	6	4	1	5	5	5	3	5	6	5	5	4	5
1	1	2	2	1	1	5	1	1	1	1	6	1	6
1	1	6	1	1	1	6	1	1	1	1	6	1	6
6	1	1	6	6	6	6	1	1	6	6	6	1	1
6	1	6	6	1	6	6	1	3	6	3	1	3	6
2	4	3	2	5	2	5	4	2	4	1	4	3	6
5	6	1	1	1	5	5	4	4	4	4	4	4	4
2	1	4	1	1	1	6	1	1	2	1	6	1	6
	1	1	1	6	1	3	1	1	1	1	1	1	6
3	1	3	2	6	1	4	1	1	6	3	6	1	6
4	1	1	1	1	3	2	1	3	5	1	1	3	1
4	1	1	1	1	1	1	3	1	2	1	2	6	6
3	3	5	2	6	3	3	1	3	4	3	6	3	6
1	6	3	1	6	1	6	6	1	1	1	6	1	6
4	3	5	4	5	4	4	5	4	5	5	5	4	3
4	1	1	1	2	4	4	2	4	2	4	3	1	6
3	1	4	1	3	3	6	1	4	4	4	3	5	6
4	1	4	1	2	1	1	1	2	2	3	6	2	1
3	1	4	1	3	1	6	1	4	4	2	1	2	5
1	1	1	1	1	1	6	1	1	1	1	1	1	6

1	1	3	1	1	1	5	1	1	4	1	6	1	6
2	3	3	1	3	2	5	4	2	3	2	3	1	4
5	1	4	1	1	2	5	1	2	5	3	6	2	6
2	2	4	1	1	1	5	1	1	1	1	4	1	5
3	1	1	1	3	1	5	1	1	1	1	4	1	6
6	3	2	1	2	1	5	4	5	5	2	3	4	3
2	6	2	1	1	1	6	1	1	1	1	6	1	6
4	5	1	1	4	1	5	5	2	2	2	5	1	6
3	1	4	1	1	1	6	1	1	3	1	1	1	6
2	1	4	1	2	2	5	1	3	3	2	1	4	6
2	1	4	1	3	2	6	2	2	2	1	2	2	1
3	2	3	1	3	3	6	3	4	3	4	3	1	6
3	1	1	1	1	1	6	1	1	4	1	1	1	1
2	1	3	1	1	1	6	1	1	4	1	6	1	6
1	1	1	1	5	1	5	1	1	1	1	6	1	6
1	3	2	1	3	2	6	1	1	6	1	3	3	5
2	1	1	1	5	1	4	3	2	2	1	3	4	6
2	3	2	1	6	2	2	4	2	5	2	3	2	5
4	5	2	4	3	2	4	4	3	3	3	2	5	3
2	2	2	1	4	2	5	4	2	4	3	4	1	5
6	3	3	6	6	6	2	6	4	6	6	2	5	4
1	1	3	1	2	1	6	2	1	1	1	4	1	6
1	4	3	1	4	1	6	4	1	2	1	1	1	6
1	1	4	1	1	1	6	1	1	2	1	1	1	6
2	3	3	1	1	1	5	1	1	3	2	6	1	6
1	1	6	1	6	1	6	6	1	1	1	1	6	6
1	1	2	1	2	1	6	1	1	1	1	1	1	6
5	6	4	1	5	5	5	3	5	6	5	5	4	5
1	1	2	2	1	1	5	1	1	1	1	6	1	6
1	1	6	1	1	1	6	1	1	1	1	6	1	6
6	1	1	6	6	6	6	1	1	6	6	6	1	1
6	1	6	6	1	6	6	1	3	6	3	1	3	6
2	4	3	2	5	2	5	4	2	4	1	4	3	6
5	6	1	1	1	5	5	4	4	4	4	4	4	4
2	1	4	1	1	1	6	1	1	2	1	6	1	6
	1	1	1	6	1	3	1	1	1	1	1	1	6
3	1	3	2	6	1	4	1	1	6	3	6	1	6
4	1	1	1	1	3	2	1	3	5	1	1	3	1
4	1	1	1	1	1	1	3	1	2	1	2	6	6
3	3	5	2	6	3	3	1	3	4	3	6	3	6
1	6	3	1	6	1	6	6	1	1	1	6	1	6
4	3	5	4	5	4	4	5	4	5	5	5	4	3
4	1	1	1	2	4	4	2	4	2	4	3	1	6

3	1	4	1	3	3	6	1	4	4	4	3	5	6
4	1	4	1	2	1	1	1	2	2	3	6	2	1
3	1	4	1	3	1	6	1	4	4	2	1	2	5
1	1	1	1	1	1	6	1	1	1	1	1	1	6
1	1	3	1	1	1	5	1	1	4	1	6	1	6
2	3	3	1	3	2	5	4	2	3	2	3	1	4
5	1	4	1	1	2	5	1	2	5	3	6	2	6
2	2	4	1	1	1	5	1	1	1	1	4	1	5
3	1	1	1	3	1	5	1	1	1	1	4	1	6
6	3	2	1	2	1	5	4	5	5	2	3	4	3
2	6	2	1	1	1	6	1	1	1	1	6	1	6
4	5	1	1	4	1	5	5	2	2	2	5	1	6
3	1	4	1	1	1	6	1	1	3	1	1	1	6
2	1	4	1	2	2	5	1	3	3	2	1	4	6
2	1	4	1	3	2	6	2	2	2	1	2	2	1
3	2	3	1	3	3	6	3	4	3	4	3	1	6
3	1	1	1	1	1	6	1	1	4	1	1	1	1
2	1	3	1	1	1	6	1	1	4	1	6	1	6
1	1	3	1	1	1	5	1	1	4	1	6	1	6
2	3	3	1	3	2	5	4	2	3	2	3	1	4
5	1	4	1	1	2	5	1	2	5	3	6	2	6
2	2	4	1	1	1	5	1	1	1	1	4	1	5
3	1	1	1	3	1	5	1	1	1	1	4	1	6
6	3	2	1	2	1	5	4	5	5	2	3	4	3
2	6	2	1	1	1	6	1	1	1	1	6	1	6
4	5	1	1	4	1	5	5	2	2	2	5	1	6
3	1	4	1	1	1	6	1	1	3	1	1	1	6
2	1	4	1	2	2	5	1	3	3	2	1	4	6
2	1	4	1	3	2	6	2	2	2	1	2	2	1
3	2	3	1	3	3	6	3	4	3	4	3	1	6
3	1	1	1	1	1	6	1	1	4	1	1	1	1
2	1	3	1	1	1	6	1	1	4	1	6	1	6

PCS27	PCS28	PCS29	PCS30	PCS31	PCS32	PCS33	PCS34	PCS35	PCS36
5	4	1	3	4	5	1	5	4	1
6	4	2	3	6	4	1	3	4	2
4	1	2	1	4	6	1	4	4	1
5	3	2	3	5	6	1	3	4	1
3	5	3	2	3	6	2	3	2	2
5	4	4	4	5	5	2	5	2	3
5	5	6	6	5	5	6	3	1	1
6	4	1	4	6	6	1	3	3	1
6	1	1	4	6	6	1	4	6	1
6	2	1	2	6	6	1	5	5	2
6	4	3	4	6	6	2	4	3	3
6	6	1	1	6	6	1	1	4	1
5	3	2	1	6	6	1	5	2	1
5	5	4	6	4	3	4	3	3	4
5	3	2	1	5	5	1	3	4	1
6	4	1	1	6	4	1	6	6	1
6	6	1	1	6	6	1	6	6	6
6	4	6	1	3	6	6	4	1	6
6	4	3	4	6	6	1	5	4	1
4	4	4	4	4	4	4	4	4	4
6	2	2	1	5	6	1	6	5	1
6	1	1	1	5	6	1	6	4	1
6	2	4	1	6	6	2	3	2	1
6	4	4	1	5	1	4	1	3	5
7	4	4	1	6	6	1	5	1	1
3	3	2	1	4	6	3	3	5	1
6	6	5	6	6	6	1	4	6	1
4	3	4	4	3	4	4	5	5	4
4	4	4	4	5	4	3	4	2	2
6	4	1	3	6	6	3	6	4	3
6	6	3	3	6	6	3	3	2	1
6	4	2	1	6	4	2	3	4	2
6	1	1	1	6	6	1	6	6	1
6	6	4	1	6	4	1	6	5	5
6	2	2	4	5	5	2	3	5	2
6	4	5	1	6	6	3	2	2	5
5	4	2	2	5	5	1	4	5	3
6	3	4	1	5	5	1	6	4	1
6	4	4	3	3	6	4	3	4	6
6	4	1	3	6	6	1	6	6	1
5	6	2	5	6	6	1	1	4	1

6	3	2	1	6	6	2	6	5	5
5	2	2	1	4	6	3	5	2	3
6	5	2	2	6	5	1	5	5	3
6	5	3	1	6	6	4	3	4	4
6	4	1	1	6	1	1	1	4	1
6	4	1	2	6	6	1	6	4	1
5	4	1	3	4	5	1	5	4	1
6	4	2	3	6	4	1	3	4	2
4	1	2	1	4	6	1	4	4	1
5	3	2	3	5	6	1	3	4	1
3	5	3	2	3	6	2	3	2	2
5	4	4	4	5	5	2	5	2	3
5	5	6	6	5	5	6	3	1	1
6	4	1	4	6	6	1	3	3	1
6	1	1	4	6	6	1	4	6	1
6	2	1	2	6	6	1	5	5	2
6	4	3	4	6	6	2	4	3	3
6	6	1	1	6	6	1	1	4	1
5	3	2	1	6	6	1	5	2	1
5	5	4	6	4	3	4	3	3	4
5	3	2	1	5	5	1	3	4	1
6	4	1	1	6	4	1	6	6	1
6	6	1	1	6	6	1	6	6	6
6	4	6	1	3	6	6	4	1	6
6	4	3	4	6	6	1	5	4	1
4	4	4	4	4	4	4	4	4	4
6	2	2	1	5	6	1	6	5	1
6	1	1	1	5	6	1	6	4	1
6	2	4	1	6	6	2	3	2	1
6	4	4	1	5	1	4	1	3	5
7	4	4	1	6	6	1	5	1	1
3	3	2	1	4	6	3	3	5	1
6	6	5	6	6	6	1	4	6	1
4	3	4	4	3	4	4	5	5	4
4	4	4	4	5	4	3	4	2	2
6	4	1	3	6	6	3	6	4	3
6	6	3	3	6	6	3	3	2	1
6	4	2	1	6	4	2	3	4	2
6	1	1	1	6	6	1	6	6	1
6	6	4	1	6	4	1	6	5	5
6	2	2	4	5	5	2	3	5	2
6	4	5	1	6	6	3	2	2	5
5	4	2	2	5	5	1	4	5	3

6	3	4	1	5	5	1	6	4	1
6	4	4	3	3	6	4	3	4	6
6	4	1	3	6	6	1	6	6	1
5	6	2	5	6	6	1	1	4	1
6	3	2	1	6	6	2	6	5	5
5	2	2	1	4	6	3	5	2	3
6	5	2	2	6	5	1	5	5	3
6	5	3	1	6	6	4	3	4	4
6	4	1	1	6	1	1	1	4	1
6	4	1	2	6	6	1	6	4	1
5	4	1	3	4	5	1	5	4	1
6	4	2	3	6	4	1	3	4	2
4	1	2	1	4	6	1	4	4	1
5	3	2	3	5	6	1	3	4	1
3	5	3	2	3	6	2	3	2	2
5	4	4	4	5	5	2	5	2	3
5	5	6	6	5	5	6	3	1	1
6	4	1	4	6	6	1	3	3	1
6	1	1	4	6	6	1	4	6	1
6	2	1	2	6	6	1	5	5	2
6	4	3	4	6	6	2	4	3	3
6	6	1	1	6	6	1	1	4	1
5	3	2	1	6	6	1	5	2	1
5	5	4	6	4	3	4	3	3	4
5	3	2	1	5	5	1	3	4	1
6	4	1	1	6	4	1	6	6	1
6	6	1	1	6	6	1	6	6	6
6	4	6	1	3	6	6	4	1	6
6	4	3	4	6	6	1	5	4	1
4	4	4	4	4	4	4	4	4	4
6	2	2	1	5	6	1	6	5	1
6	1	1	1	5	6	1	6	4	1
6	2	4	1	6	6	2	3	2	1
6	4	4	1	5	1	4	1	3	5
7	4	4	1	6	6	1	5	1	1
3	3	2	1	4	6	3	3	5	1
6	6	5	6	6	6	1	4	6	1
4	3	4	4	3	4	4	5	5	4
4	4	4	4	5	4	3	4	2	2
6	4	1	3	6	6	3	6	4	3
6	6	3	3	6	6	3	3	2	1
6	4	2	1	6	4	2	3	4	2
6	1	1	1	6	6	1	6	6	1

6	6	4	1	6	4	1	6	5	5
6	2	2	4	5	5	2	3	5	2
6	4	5	1	6	6	3	2	2	5
5	4	2	2	5	5	1	4	5	3
6	3	4	1	5	5	1	6	4	1
6	4	4	3	3	6	4	3	4	6
6	4	1	3	6	6	1	6	6	1
5	6	2	5	6	6	1	1	4	1
6	3	2	1	6	6	2	6	5	5
5	2	2	1	4	6	3	5	2	3
6	5	2	2	6	5	1	5	5	3
6	5	3	1	6	6	4	3	4	4
6	4	1	1	6	1	1	1	4	1
6	4	1	2	6	6	1	6	4	1
5	4	1	3	4	5	1	5	4	1
6	4	2	3	6	4	1	3	4	2
4	1	2	1	4	6	1	4	4	1
5	3	2	3	5	6	1	3	4	1
3	5	3	2	3	6	2	3	2	2
5	4	4	4	5	5	2	5	2	3
5	5	6	6	5	5	6	3	1	1
6	4	1	4	6	6	1	3	3	1
6	1	1	4	6	6	1	4	6	1
6	2	1	2	6	6	1	5	5	2
6	4	3	4	6	6	2	4	3	3
6	6	1	1	6	6	1	1	4	1
5	3	2	1	6	6	1	5	2	1
5	5	4	6	4	3	4	3	3	4
5	3	2	1	5	5	1	3	4	1
6	4	1	1	6	4	1	6	6	1
6	6	1	1	6	6	1	6	6	6
6	4	6	1	3	6	6	4	1	6
6	4	3	4	6	6	1	5	4	1
4	4	4	4	4	4	4	4	4	4
6	2	2	1	5	6	1	6	5	1
6	1	1	1	5	6	1	6	4	1
6	2	4	1	6	6	2	3	2	1
6	4	4	1	5	1	4	1	3	5
7	4	4	1	6	6	1	5	1	1
3	3	2	1	4	6	3	3	5	1
6	6	5	6	6	6	1	4	6	1
4	3	4	4	3	4	4	5	5	4
4	4	4	4	5	4	3	4	2	2

6	4	1	3	6	6	3	6	4	3
6	6	3	3	6	6	3	3	2	1
6	4	2	1	6	4	2	3	4	2
6	1	1	1	6	6	1	6	6	1
6	6	4	1	6	4	1	6	5	5
6	2	2	4	5	5	2	3	5	2
6	4	5	1	6	6	3	2	2	5
5	4	2	2	5	5	1	4	5	3
6	3	4	1	5	5	1	6	4	1
6	4	4	3	3	6	4	3	4	6
6	4	1	3	6	6	1	6	6	1
5	6	2	5	6	6	1	1	4	1
6	3	2	1	6	6	2	6	5	5
5	2	2	1	4	6	3	5	2	3
6	5	2	2	6	5	1	5	5	3
6	5	3	1	6	6	4	3	4	4
6	4	1	1	6	1	1	1	4	1
6	4	1	2	6	6	1	6	4	1
6	6	4	1	6	4	1	6	5	5
6	2	2	4	5	5	2	3	5	2
6	4	5	1	6	6	3	2	2	5
5	4	2	2	5	5	1	4	5	3
6	3	4	1	5	5	1	6	4	1
6	4	4	3	3	6	4	3	4	6
6	4	1	3	6	6	1	6	6	1
5	6	2	5	6	6	1	1	4	1
6	3	2	1	6	6	2	6	5	5
5	2	2	1	4	6	3	5	2	3
6	5	2	2	6	5	1	5	5	3
6	5	3	1	6	6	4	3	4	4
6	4	1	1	6	1	1	1	4	1
6	4	1	2	6	6	1	6	4	1

D.2 Male data set

student	age	Programming Experience	Software experience	computer access	plan to study CS	>25 Years (yes,no)
1	18	no	yes	no	maybe	no
2	21	no	no	no	yes	no
3	21	no	yes	no	no	no
4	21	yes	yes	no	no	no
5	21	no	no	no	no	no
6	21	no	no	no	no	no
7	21	no	yes	yes	no	no
8	21	yes	yes	yes	no	no
9	21	no	yes	yes	no	no
10	21	no	no	yes	no	no
11	21	no	no	yes	no	no
12	22	yes	yes	yes	maybe	no
13	23	no	no	yes	no	no
14	23	no	no	yes	no	no
15	23	no	no	yes	no	no
16	23	no	yes	yes	no	no
17	24	yes	yes	yes	yes	no
18	24	no	yes	yes	yes	no
19	25	no	yes	yes	no	yes
20	25	no	yes	yes	no	yes
21	25	no	yes	yes	no	yes
22	25	yes	yes	yes	no	yes
23	25	yes	yes	yes	no	yes
24	25	no	yes	yes	no	yes
25	26	yes	no	yes	maybe	yes
26	26	no	yes	yes	no	yes
27	26	no	yes	yes	no	yes
28	26	yes	yes	yes	no	yes
29	26	yes	no	yes	no	yes
30	26	no	yes	yes	no	yes
31	28	no	yes	yes	maybe	yes
32	28	no	yes	yes	no	yes
33	28	no	yes	yes	no	yes
34	28	no	yes	yes	no	yes
35	28	no	yes	yes	no	yes
36	28	no	yes	yes	no	yes
37	28	yes	no	yes	no	yes
38	28	yes	yes	yes	no	yes
39	28	yes	yes	yes	no	yes
40	28	no	yes	yes	no	yes

41	28	no	yes	yes	no	yes
42	31	no	no	yes	maybe	yes
43	32	yes	yes	yes	yes	yes
44	32	yes	yes	yes	yes	yes
45	32	no	yes	yes	no	yes
46	32	no	yes	yes	no	yes
47	32	yes	yes	yes	no	yes
48	32	yes	yes	yes	no	yes
49	36	yes	yes	yes	yes	yes
50	36	no	yes	yes	no	yes
51	36	no	yes	yes	no	yes
52	36	yes	yes	yes	no	yes
53	36	no	yes	yes	no	yes
54	36	no	yes	yes	no	yes
55	36	yes	no	yes	no	yes
56	37	no	no	yes	no	yes
57	37	no	yes	yes	no	yes
58	37	no	yes	yes	no	yes
59	37	no	no	yes	no	yes
60	37	yes	yes	yes	no	yes
61	37	yes	yes	yes	no	yes
62	37	no	no	yes	no	yes
63	37	yes	yes	yes	no	yes
64	37	no	yes	yes	no	yes
65	37	no	yes	yes	no	yes
66	37	no	yes	yes	no	yes
67	37	yes	yes	yes	no	yes
68	41	no	yes	yes	no	yes
69	42	no	yes	yes	no	yes
70	42	no	no	yes	no	yes
71	42	no	no	yes	no	yes
72	42	no	no	yes	maybe	yes
73	42	no	no	yes	no	yes
74	42	no	yes	yes	no	yes
75	42	no	yes	yes	no	yes
76	42	no	no	yes	no	yes
77	42	no	no	yes	no	yes
78	42	no	yes	yes	no	yes
79	42	no	no	yes	maybe	yes
80	43	no	yes	yes	no	yes
81	44	no	yes	yes	no	yes
82	44	no	no	yes	no	yes

83	44	no	yes	yes	no	yes
84	44	no	yes	yes	no	yes
85	44	no	no	yes	no	yes
86	44	yes	yes	yes	no	yes
87	44	yes	yes	yes	no	yes
88	45	yes	yes	yes	no	yes
89	45	no	no	yes	no	yes
90	45	no	no	yes	no	yes
91	45	yes	yes	yes	no	yes
92	45	yes	yes	yes	no	yes
93	45	no	yes	yes	no	yes
94	46	no	no	yes	no	yes
95	46	yes	yes	yes	no	yes
96	46	yes	yes	yes	no	yes
97	46	no	yes	yes	no	yes
98	46	no	no	yes	no	yes
99	46	no	no	yes	no	yes
100	47	no	yes	yes	no	yes
101	48	no	no	yes	no	yes
102	53	no	no	yes	no	yes
103	55	no	yes	yes	yes	yes
104	55	no	yes	yes	no	yes
105	58	no	yes	yes	no	yes
106	58	no	no	yes	no	yes
107	58	no	no	yes	no	yes
108	71	no	yes	yes	no	yes

Work_Fulltime	married/Partner	havechildren	Major	classification	fulltime_student	Years_In_School
no	yes	no	business	junior	yes	15.6
yes	no	no	undeclared	sophomore	yes	15.6
yes	no	yes	engineering	freshman	yes	14.6
yes	no	no	business	freshman	yes	14
no	no	yes	psychology	freshman	yes	13.6
yes	yes	yes	business	freshman	yes	13.2
no	yes	yes	PM	graduate	no	18.6
yes	no	yes	business	junior	yes	15.9
yes	yes	yes	business	junior	no	16
yes	yes	yes	-	graduate	no	13.3
yes	yes	yes	psychology	freshman	no	13.3
yes	yes	no	business	freshman	no	15
yes	no	no	business	sophomore	no	14.6
no	yes	yes	nursing	sophomore	yes	15.6
no	no	no	psychology	senior	yes	17
yes	yes	yes	business	freshman	no	14.6
no	no	no	business	junior	yes	15.2
yes	no	yes	business	freshman	yes	13.5
no	yes	no	business	junior	yes	15.6
yes	no	no	undeclared	sophomore	yes	15.6
yes	no	yes	engineering	freshman	yes	14.6
yes	no	no	business	freshman	yes	14
no	no	yes	psychology	freshman	yes	13.6
yes	yes	yes	business	freshman	yes	13.2
no	yes	yes	PM	graduate	no	18.6
yes	no	yes	business	junior	yes	15.9
yes	yes	yes	business	junior	no	16
yes	yes	yes	-	graduate	no	13.3
yes	yes	yes	psychology	freshman	no	13.3
yes	yes	no	business	freshman	no	15
yes	no	no	business	sophomore	no	14.6
no	yes	yes	nursing	sophomore	yes	15.6
no	no	no	psychology	senior	yes	17
yes	yes	yes	business	freshman	no	14.6
no	no	no	business	junior	yes	15.2
yes	no	yes	business	freshman	yes	13.5
no	yes	no	business	junior	yes	15.6
yes	no	no	undeclared	sophomore	yes	15.6
yes	no	yes	engineering	freshman	yes	14.6
yes	no	no	business	freshman	yes	14
no	no	yes	psychology	freshman	yes	13.6

yes	yes	yes	business	freshman	yes	13.2
no	yes	yes	PM	graduate	no	18.6
yes	no	yes	business	junior	yes	15.9
yes	yes	yes	business	junior	no	16
yes	yes	yes	-	graduate	no	13.3
yes	yes	yes	psychology	freshman	no	13.3
yes	yes	no	business	freshman	no	15
yes	no	no	business	sophomore	no	14.6
no	yes	yes	nursing	sophomore	yes	15.6
no	no	no	psychology	senior	yes	17
yes	yes	yes	business	freshman	no	14.6
no	no	no	business	junior	yes	15.2
yes	no	yes	business	freshman	yes	13.5
no	yes	no	business	junior	yes	15.6
yes	no	no	undeclared	sophomore	yes	15.6
yes	no	yes	engineering	freshman	yes	14.6
yes	no	no	business	freshman	yes	14
no	no	yes	psychology	freshman	yes	13.6
yes	yes	yes	business	freshman	yes	13.2
no	yes	yes	PM	graduate	no	18.6
yes	no	yes	business	junior	yes	15.9
yes	yes	yes	business	junior	no	16
yes	yes	yes	-	graduate	no	13.3
yes	yes	yes	psychology	freshman	no	13.3
yes	yes	no	business	freshman	no	15
yes	no	no	business	sophomore	no	14.6
no	yes	yes	nursing	sophomore	yes	15.6
no	no	no	psychology	senior	yes	17
yes	yes	yes	business	freshman	no	14.6
no	no	no	business	junior	yes	15.2
yes	no	yes	business	freshman	yes	13.5
no	yes	no	business	junior	yes	15.6
yes	no	no	undeclared	sophomore	yes	15.6
yes	no	yes	engineering	freshman	yes	14.6
yes	no	no	business	freshman	yes	14
no	no	yes	psychology	freshman	yes	13.6
yes	yes	yes	business	freshman	yes	13.2
no	yes	yes	PM	graduate	no	18.6
yes	no	yes	business	junior	yes	15.9
yes	yes	yes	business	junior	no	16
yes	yes	yes	-	graduate	no	13.3
yes	yes	yes	psychology	freshman	no	13.3
yes	yes	no	business	freshman	no	15

yes	no	no	business	sophomore	no	14.6
no	yes	yes	nursing	sophomore	yes	15.6
no	no	no	psychology	senior	yes	17
yes	yes	yes	business	freshman	no	14.6
no	no	no	business	junior	yes	15.2
yes	no	yes	business	freshman	yes	13.5
no	yes	no	business	junior	yes	15.6
yes	no	no	undeclared	sophomore	yes	15.6
yes	no	yes	engineering	freshman	yes	14.6
yes	no	no	business	freshman	yes	14
no	no	yes	psychology	freshman	yes	13.6
yes	yes	yes	business	freshman	yes	13.2
no	yes	yes	PM	graduate	no	18.6
yes	no	yes	business	junior	yes	15.9
yes	yes	yes	business	junior	no	16
yes	yes	yes	-	graduate	no	13.3
yes	yes	yes	psychology	freshman	no	13.3
yes	yes	no	business	freshman	no	15
yes	no	no	business	sophomore	no	14.6
no	yes	yes	nursing	sophomore	yes	15.6
no	no	no	psychology	senior	yes	17
yes	yes	yes	business	freshman	no	14.6
no	no	no	business	junior	yes	15.2
yes	no	yes	business	freshman	yes	13.5

Years_in_college	GradeExpected	Use_PC_Days	Use_Internet_Hours	Play_Games_Hours	Use_Software_Hours
2.6	A	3	1	0	0
2.6	B	3	8	2	0
1.6	A	7	6	0	6
1	A	7	5	1	3
0.6	A	7	10	0	5
0.2	B	1	0	4	0
5.6	B	7	0	0	8
2.9	A	7	15	1	20
3	A	7	4	0	25
0.3	B	7	3	0	12
0.3	B	7	4	0	0
2	A	7	45	15	5
1.6	-	3	5	1	0
2.6	A	7	3	0.5	20
4	B	7	2	0	0
1.6	A	7	20	1	30
2.2	B	3	0.5	0.5	0
0.5	A	7	60	10	35
2.6	A	3	1	0	0
2.6	B	3	8	2	0
1.6	A	7	6	0	6
1	A	7	5	1	3
0.6	A	7	10	0	5
0.2	B	1	0	4	0
5.6	B	7	0	0	8
2.9	A	7	15	1	20
3	A	7	4	0	25
0.3	B	7	3	0	12
0.3	B	7	4	0	0
2	A	7	45	15	5
1.6	-	3	5	1	0
2.6	A	7	3	0.5	20
4	B	7	2	0	0
1.6	A	7	20	1	30
2.2	B	3	0.5	0.5	0
0.5	A	7	60	10	35
2.6	A	3	1	0	0
2.6	B	3	8	2	0
1.6	A	7	6	0	6
1	A	7	5	1	3
0.6	A	7	10	0	5

0.2	B	1	0	4	0
5.6	B	7	0	0	8
2.9	A	7	15	1	20
3	A	7	4	0	25
0.3	B	7	3	0	12
0.3	B	7	4	0	0
2	A	7	45	15	5
1.6	-	3	5	1	0
2.6	A	7	3	0.5	20
4	B	7	2	0	0
1.6	A	7	20	1	30
2.2	B	3	0.5	0.5	0
0.5	A	7	60	10	35
2.6	A	3	1	0	0
2.6	B	3	8	2	0
1.6	A	7	6	0	6
1	A	7	5	1	3
0.6	A	7	10	0	5
0.2	B	1	0	4	0
5.6	B	7	0	0	8
2.9	A	7	15	1	20
3	A	7	4	0	25
0.3	B	7	3	0	12
0.3	B	7	4	0	0
2	A	7	45	15	5
1.6	-	3	5	1	0
2.6	A	7	3	0.5	20
4	B	7	2	0	0
1.6	A	7	20	1	30
2.2	B	3	0.5	0.5	0
0.5	A	7	60	10	35
2.6	A	3	1	0	0
2.6	B	3	8	2	0
1.6	A	7	6	0	6
1	A	7	5	1	3
0.6	A	7	10	0	5
0.2	B	1	0	4	0
5.6	B	7	0	0	8
2.9	A	7	15	1	20
3	A	7	4	0	25
0.3	B	7	3	0	12
0.3	B	7	4	0	0
2	A	7	45	15	5

1.6	-	3	5	1	0
2.6	A	7	3	0.5	20
4	B	7	2	0	0
1.6	A	7	20	1	30
2.2	B	3	0.5	0.5	0
0.5	A	7	60	10	35
2.6	A	3	1	0	0
2.6	B	3	8	2	0
1.6	A	7	6	0	6
1	A	7	5	1	3
0.6	A	7	10	0	5
0.2	B	1	0	4	0
5.6	B	7	0	0	8
2.9	A	7	15	1	20
3	A	7	4	0	25
0.3	B	7	3	0	12
0.3	B	7	4	0	0
2	A	7	45	15	5
1.6	-	3	5	1	0
2.6	A	7	3	0.5	20
4	B	7	2	0	0
1.6	A	7	20	1	30
2.2	B	3	0.5	0.5	0
0.5	A	7	60	10	35

CSE1	CSE2	CSE3	CSE4	CSE5	CSE6	CSE7	CSE8	CSE9	CSE10	TM1	TM2	TM3	TM4	TM5	TM6	CM1
7	6	7	8	8	8	7	6	8	7	4	4	4	4	5	5	3
3	2	4	7	8	9	8	10	7	7	2	1	1	4	5	4	4
8	8	10	9	9	9	9	9	10	10	3	3	2	3	3	5	3
9	8	8	10	10	10	10	9	10	10	5	5	5	5	5	5	5
3	0	9	7	10	10	0	5	10	7	3	3	5	1	5	5	5
3	4	8	10	9	10	10	8	10	10	3	2	1	3	3	3	4
0	0	5	6	4	4	5	4	3	3	0	0	0	0	4	5	4
7	7	7	7	7	7	7	7	6	6	4	4	4	4	4	4	4
8	8	9	7	8	8	8	8	8	8	4	3	3	3	4	4	4
8	6	0	6	9	7	9	0	8	10	4	5	5	4	4	5	4
0	6	4	2	4	5	7	6	5	6	5	5	1	3	5	1	1
8	8	5	7	8	9	9	4	7	9	4	4	2	3	3	3	4
5	1	5	10	5	5	5	5	10	1	5	4	5	4	5	5	5
7	5	5	8	9	8	8	6	10	9	4	4	4	4	5	5	5
0	0	0	3	3	0	0	0	5	3	5	3	4	3	2	3	1
0	6	6	3	7	6	9	7	9	10	3	3	3	3	2	4	4
0	0	0	2	2	3	2	2	5	5	3	4	3	4	4	4	5
8	7	10	9	7	8	10	7	8	9	4	3	1	2	5	5	5
7	6	7	8	8	8	7	6	8	7	4	4	4	4	5	5	3
3	2	4	7	8	9	8	10	7	7	2	1	1	4	5	4	4
8	8	10	9	9	9	9	9	10	10	3	3	2	3	3	5	3
9	8	8	10	10	10	10	9	10	10	5	5	5	5	5	5	5
3	0	9	7	10	10	0	5	10	7	3	3	5	1	5	5	5
3	4	8	10	9	10	10	8	10	10	3	2	1	3	3	3	4
0	0	5	6	4	4	5	4	3	3	0	0	0	0	4	5	4
7	7	7	7	7	7	7	7	6	6	4	4	4	4	4	4	4
8	8	9	7	8	8	8	8	8	8	4	3	3	3	4	4	4
8	6	0	6	9	7	9	0	8	10	4	5	5	4	4	5	4
0	6	4	2	4	5	7	6	5	6	5	5	1	3	5	1	1
8	8	5	7	8	9	9	4	7	9	4	4	2	3	3	3	4
5	1	5	10	5	5	5	5	10	1	5	4	5	4	5	5	5
7	5	5	8	9	8	8	6	10	9	4	4	4	4	5	5	5
0	0	0	3	3	0	0	0	5	3	5	3	4	3	2	3	1
0	6	6	3	7	6	9	7	9	10	3	3	3	3	2	4	4
0	0	0	2	2	3	2	2	5	5	3	4	3	4	4	4	5
8	7	10	9	7	8	10	7	8	9	4	3	1	2	5	5	5
7	6	7	8	8	8	7	6	8	7	4	4	4	4	5	5	3
3	2	4	7	8	9	8	10	7	7	2	1	1	4	5	4	4
8	8	10	9	9	9	9	9	10	10	3	3	2	3	3	5	3
9	8	8	10	10	10	10	9	10	10	5	5	5	5	5	5	5
3	0	9	7	10	10	0	5	10	7	3	3	5	1	5	5	5

3	4	8	10	9	10	10	8	10	10	3	2	1	3	3	3	4
0	0	5	6	4	4	5	4	3	3	0	0	0	0	4	5	4
7	7	7	7	7	7	7	7	6	6	4	4	4	4	4	4	4
8	8	9	7	8	8	8	8	8	8	4	3	3	3	4	4	4
8	6	0	6	9	7	9	0	8	10	4	5	5	4	4	5	4
0	6	4	2	4	5	7	6	5	6	5	5	1	3	5	1	1
8	8	5	7	8	9	9	4	7	9	4	4	2	3	3	3	4
5	1	5	10	5	5	5	5	10	1	5	4	5	4	5	5	5
7	5	5	8	9	8	8	6	10	9	4	4	4	4	5	5	5
0	0	0	3	3	0	0	0	5	3	5	3	4	3	2	3	1
0	6	6	3	7	6	9	7	9	10	3	3	3	3	2	4	4
0	0	0	2	2	3	2	2	5	5	3	4	3	4	4	4	5
8	7	10	9	7	8	10	7	8	9	4	3	1	2	5	5	5
7	6	7	8	8	8	7	6	8	7	4	4	4	4	5	5	3
3	2	4	7	8	9	8	10	7	7	2	1	1	4	5	4	4
8	8	10	9	9	9	9	9	10	10	3	3	2	3	3	5	3
9	8	8	10	10	10	10	9	10	10	5	5	5	5	5	5	5
3	0	9	7	10	10	0	5	10	7	3	3	5	1	5	5	5
3	4	8	10	9	10	10	8	10	10	3	2	1	3	3	3	4
0	0	5	6	4	4	5	4	3	3	0	0	0	0	4	5	4
7	7	7	7	7	7	7	7	6	6	4	4	4	4	4	4	4
8	8	9	7	8	8	8	8	8	8	4	3	3	3	4	4	4
8	6	0	6	9	7	9	0	8	10	4	5	5	4	4	5	4
0	6	4	2	4	5	7	6	5	6	5	5	1	3	5	1	1
8	8	5	7	8	9	9	4	7	9	4	4	2	3	3	3	4
5	1	5	10	5	5	5	5	10	1	5	4	5	4	5	5	5
7	5	5	8	9	8	8	6	10	9	4	4	4	4	5	5	5
0	0	0	3	3	0	0	0	5	3	5	3	4	3	2	3	1
0	6	6	3	7	6	9	7	9	10	3	3	3	3	2	4	4
0	0	0	2	2	3	2	2	5	5	3	4	3	4	4	4	5
8	7	10	9	7	8	10	7	8	9	4	3	1	2	5	5	5
7	6	7	8	8	8	7	6	8	7	4	4	4	4	5	5	3
3	2	4	7	8	9	8	10	7	7	2	1	1	4	5	4	4
8	8	10	9	9	9	9	9	10	10	3	3	2	3	3	5	3
9	8	8	10	10	10	10	9	10	10	5	5	5	5	5	5	5
3	0	9	7	10	10	0	5	10	7	3	3	5	1	5	5	5
3	4	8	10	9	10	10	8	10	10	3	2	1	3	3	3	4
0	0	5	6	4	4	5	4	3	3	0	0	0	0	4	5	4
7	7	7	7	7	7	7	7	6	6	4	4	4	4	4	4	4
8	8	9	7	8	8	8	8	8	8	4	3	3	3	4	4	4
8	6	0	6	9	7	9	0	8	10	4	5	5	4	4	5	4
0	6	4	2	4	5	7	6	5	6	5	5	1	3	5	1	1
8	8	5	7	8	9	9	4	7	9	4	4	2	3	3	3	4

5	1	5	10	5	5	5	5	10	1	5	4	5	4	5	5	5
7	5	5	8	9	8	8	6	10	9	4	4	4	4	5	5	5
0	0	0	3	3	0	0	0	5	3	5	3	4	3	2	3	1
0	6	6	3	7	6	9	7	9	10	3	3	3	3	2	4	4
0	0	0	2	2	3	2	2	5	5	3	4	3	4	4	4	5
8	7	10	9	7	8	10	7	8	9	4	3	1	2	5	5	5
7	6	7	8	8	8	7	6	8	7	4	4	4	4	5	5	3
3	2	4	7	8	9	8	10	7	7	2	1	1	4	5	4	4
8	8	10	9	9	9	9	9	10	10	3	3	2	3	3	5	3
9	8	8	10	10	10	10	9	10	10	5	5	5	5	5	5	5
3	0	9	7	10	10	0	5	10	7	3	3	5	1	5	5	5
3	4	8	10	9	10	10	8	10	10	3	2	1	3	3	3	4
0	0	5	6	4	4	5	4	3	3	0	0	0	0	4	5	4
7	7	7	7	7	7	7	7	6	6	4	4	4	4	4	4	4
8	8	9	7	8	8	8	8	8	8	4	3	3	3	4	4	4
8	6	0	6	9	7	9	0	8	10	4	5	5	4	4	5	4
0	6	4	2	4	5	7	6	5	6	5	5	1	3	5	1	1
8	8	5	7	8	9	9	4	7	9	4	4	2	3	3	3	4
5	1	5	10	5	5	5	5	10	1	5	4	5	4	5	5	5
7	5	5	8	9	8	8	6	10	9	4	4	4	4	5	5	5
0	0	0	3	3	0	0	0	5	3	5	3	4	3	2	3	1
0	6	6	3	7	6	9	7	9	10	3	3	3	3	2	4	4
0	0	0	2	2	3	2	2	5	5	3	4	3	4	4	4	5
8	7	10	9	7	8	10	7	8	9	4	3	1	2	5	5	5

CM2	CM3	CM4	CM5	IF1	IF2	IF3	IF4	I1	I2	I3	I4	S1	S2	S3	S4	S5	S6	S7	M1	M2	M3	M4	M5	PCS1
3	4	3	3	4	4	2	4	3	3	3	3	4	4	3	3	4	5	4	4	3	3	4	4	5
5	5	5	5	4	4	3	4	4	4	5	3	5	4	4	4	4	5	5	4	5	5	5	4	5
5	4	3	3	5	5	5	4	3	3	3	3	5	5	3	3	5	5	5	5	3	3	3	3	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
5	4	4	4	5	3	3	5	4	1	3	3	1	3	3	1	1	3	1	1	1	3	5	3	5
5	5	5	5	5	5	5	5	5	5	5	3	5	5	0	0	0	5	5	5	3	5	5	5	5
5	5	5	5	0	0	5	0	0	0	5	0	5	0	0	0	5	5	5	0	0	0	0	0	4
4	4	3	3	3	4	4	4	4	3	2	1	1	4	4	4	4	4	4	4	4	4	4	4	6
4	4	4	4	4	4	5	4	4	4	4	4	5	5	5	4	4	5	4	4	4	4	4	4	6
5	4	5	4	5	5	3	5	4	3	4	4	5	5	5	4	5	5	5	5	4	5	5	5	5
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	4	3	5	1	4
5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	4	5	5	5	3	4	5	4	6
5	5	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
5	4	4	5	5	4	5	5	4	3	3	4	5	5	4	3	4	5	3	4	4	4	4	3	5
1	1	1	3	5	5	2	5	3	2	2	1	5	4	3	4	2	5	3	5	5	5	5	3	4
3	4	2	4	4	2	3	4	2	2	3	3	4	3	4	4	4	4	4	3	2	4	4	3	4
5	4	4	4	4	5	4	4	4	2	4	3	4	4	3	3	5	5	3	3	3	4	5	4	4
5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
3	4	3	3	4	4	2	4	3	3	3	3	4	4	3	3	4	5	4	4	3	3	4	4	5
5	5	5	5	4	4	3	4	4	4	5	3	5	4	4	4	4	5	5	4	5	5	5	4	5
5	4	3	3	5	5	5	4	3	3	3	3	5	5	3	3	5	5	5	5	3	3	3	3	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
5	4	4	4	5	3	3	5	4	1	3	3	1	3	3	1	1	3	1	1	1	3	5	3	5
5	5	5	5	5	5	5	5	5	5	5	3	5	5	0	0	0	5	5	5	3	5	5	5	5
5	5	5	5	0	0	5	0	0	0	5	0	5	0	0	0	5	5	5	0	0	0	0	0	4
4	4	3	3	3	4	4	4	4	3	2	1	1	4	4	4	4	4	4	4	4	4	4	4	6
4	4	4	4	4	4	5	4	4	4	4	4	5	5	5	4	4	5	4	4	4	4	4	4	6
5	4	5	4	5	5	3	5	4	3	4	4	5	5	5	4	5	5	5	5	4	5	5	5	5
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	4	3	5	1	4
5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	4	5	5	5	3	4	5	4	6
5	5	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
5	4	4	5	5	4	5	5	4	3	3	4	5	5	4	3	4	5	3	4	4	4	4	3	5
1	1	1	3	5	5	2	5	3	2	2	1	5	4	3	4	2	5	3	5	5	5	5	3	4
3	4	2	4	4	2	3	4	2	2	3	3	4	3	4	4	4	4	4	3	2	4	4	3	4
5	4	4	4	4	5	4	4	4	2	4	3	4	4	3	3	5	5	3	3	3	4	5	4	4
5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
3	4	3	3	4	4	2	4	3	3	3	3	4	4	3	3	4	5	4	4	3	3	4	4	5
5	5	5	5	4	4	3	4	4	4	5	3	5	4	4	4	4	5	5	4	5	5	5	4	5
5	4	3	3	5	5	5	4	3	3	3	3	5	5	3	3	5	5	5	5	3	3	3	3	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
5	4	4	4	5	3	3	5	4	1	3	3	1	3	3	1	1	3	1	1	1	3	5	3	5

5	5	5	5	5	5	5	5	5	5	5	3	5	5	0	0	0	5	5	5	3	5	5	5	5
5	5	5	5	0	0	5	0	0	0	5	0	5	0	0	0	5	5	5	0	0	0	0	0	4
4	4	3	3	3	4	4	4	4	3	2	1	1	4	4	4	4	4	4	4	4	4	4	4	6
4	4	4	4	4	4	5	4	4	4	4	4	5	5	5	4	4	5	4	4	4	4	4	4	6
5	4	5	4	5	5	3	5	4	3	4	4	5	5	5	4	5	5	5	5	4	5	5	5	5
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	4	3	5	1	4
5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	4	5	5	5	3	4	5	4	6
5	5	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
5	4	4	5	5	4	5	5	4	3	3	4	5	5	4	3	4	5	3	4	4	4	4	3	5
1	1	1	3	5	5	2	5	3	2	2	1	5	4	3	4	2	5	3	5	5	5	5	3	4
3	4	2	4	4	2	3	4	2	2	3	3	4	3	4	4	4	4	4	3	2	4	4	3	4
5	4	4	4	4	5	4	4	4	2	4	3	4	4	3	3	5	5	3	3	3	4	5	4	4
5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
3	4	3	3	4	4	2	4	3	3	3	3	4	4	3	3	4	5	4	4	3	3	4	4	5
5	5	5	5	4	4	3	4	4	4	5	3	5	4	4	4	4	5	5	4	5	5	5	4	5
5	4	3	3	5	5	5	4	3	3	3	3	5	5	3	3	5	5	5	5	3	3	3	3	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
5	4	4	4	5	3	3	5	4	1	3	3	1	3	3	1	1	3	1	1	1	3	5	3	5
5	5	5	5	5	5	5	5	5	5	5	3	5	5	0	0	0	5	5	5	3	5	5	5	5
5	5	5	5	0	0	5	0	0	0	5	0	5	0	0	0	5	5	5	0	0	0	0	0	4
4	4	3	3	3	4	4	4	4	3	2	1	1	4	4	4	4	4	4	4	4	4	4	4	6
4	4	4	4	4	4	5	4	4	4	4	4	5	5	5	4	4	5	4	4	4	4	4	4	6
5	4	5	4	5	5	3	5	4	3	4	4	5	5	5	4	5	5	5	5	4	5	5	5	5
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	4	3	5	1	4
5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	4	5	5	5	3	4	5	4	6
5	5	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
5	4	4	5	5	4	5	5	4	3	3	4	5	5	4	3	4	5	3	4	4	4	4	3	5
1	1	1	3	5	5	2	5	3	2	2	1	5	4	3	4	2	5	3	5	5	5	5	3	4
3	4	2	4	4	2	3	4	2	2	3	3	4	3	4	4	4	4	4	3	2	4	4	3	4
5	4	4	4	4	5	4	4	4	2	4	3	4	4	3	3	5	5	3	3	3	4	5	4	4
5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
3	4	3	3	4	4	2	4	3	3	3	3	4	4	3	3	4	5	4	4	3	3	4	4	5
5	5	5	5	4	4	3	4	4	4	5	3	5	4	4	4	4	5	5	4	5	5	5	4	5
5	4	3	3	5	5	5	4	3	3	3	3	5	5	3	3	5	5	5	5	3	3	3	3	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
5	4	4	4	5	3	3	5	4	1	3	3	1	3	3	1	1	3	1	1	1	3	5	3	5
5	5	5	5	5	5	5	5	5	5	5	3	5	5	0	0	0	5	5	5	3	5	5	5	5
5	5	5	5	0	0	5	0	0	0	5	0	5	0	0	0	5	5	5	0	0	0	0	0	4
4	4	3	3	3	4	4	4	4	3	2	1	1	4	4	4	4	4	4	4	4	4	4	4	6
4	4	4	4	4	4	5	4	4	4	4	4	5	5	5	4	4	5	4	4	4	4	4	4	6
5	4	5	4	5	5	3	5	4	3	4	4	5	5	5	4	5	5	5	5	4	5	5	5	5
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	4	3	5	1	4
5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	4	5	5	5	3	4	5	4	6

5	5	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
5	4	4	5	5	4	5	5	4	3	3	4	5	5	4	3	4	5	3	4	4	4	4	3	5
1	1	1	3	5	5	2	5	3	2	2	1	5	4	3	4	2	5	3	5	5	5	5	3	4
3	4	2	4	4	2	3	4	2	2	3	3	4	3	4	4	4	4	4	3	2	4	4	3	4
5	4	4	4	4	5	4	4	4	2	4	3	4	4	3	3	5	5	3	3	3	4	5	4	4
5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
3	4	3	3	4	4	2	4	3	3	3	3	4	4	3	3	4	5	4	4	3	3	4	4	5
5	5	5	5	4	4	3	4	4	4	5	3	5	4	4	4	4	5	5	4	5	5	5	4	5
5	4	3	3	5	5	5	4	3	3	3	3	5	5	3	3	5	5	5	5	3	3	3	3	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
5	4	4	4	5	3	3	5	4	1	3	3	1	3	3	1	1	3	1	1	1	3	5	3	5
5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	0	0	0	5	5	5	3	5	5	5
5	5	5	5	0	0	5	0	0	0	5	0	5	0	0	0	5	5	5	0	0	0	0	0	4
4	4	3	3	3	4	4	4	4	3	2	1	1	4	4	4	4	4	4	4	4	4	4	4	6
4	4	4	4	4	4	5	4	4	4	4	4	5	5	5	4	4	5	4	4	4	4	4	4	6
5	4	5	4	5	5	3	5	4	3	4	4	5	5	5	4	5	5	5	5	4	5	5	5	5
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	4	3	5	1	4
5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	4	5	5	5	3	4	5	4	6
5	5	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4
5	4	4	5	5	4	5	5	4	3	3	4	5	5	4	3	4	5	3	4	4	4	4	3	5
1	1	1	3	5	5	2	5	3	2	2	1	5	4	3	4	2	5	3	5	5	5	5	3	4
3	4	2	4	4	2	3	4	2	2	3	3	4	3	4	4	4	4	4	3	2	4	4	3	4
5	4	4	4	4	5	4	4	4	2	4	3	4	4	3	3	5	5	3	3	3	4	5	4	4
5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6

PCS2	PCS3	PCS4	PCS5	PCS6	PCS7	PCS8	PCS9	PCS10	PCS11	PCS12	PCS13	PCS14	PCS15	PCS16	PCS17
4	6	1	1	1	3	2	1	3	5	2	2	1	5	2	1
5	6	1	1	1	6	1	1	6	6	3	1	1	3	1	5
4	6	1	5	1	6	1	1	6	6	2	5	5	2	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	6	1	6
4	6	1	3	3	5	1	1	6	5	3	3	2	3	1	2
4	6	2	3	1	5	1	1	6	5	2	2	3	3	1	3
3	6	4	3	4	3	4	2	4	3	4	4	3	4	1	3
5	6	1	1	1	6	1	1	6	6	1	1	2	3	1	4
6	6	1	2	2	5	2	1	5	5	2	3	1	2	2	2
5	6	5	1	1	5	1	1	5	4	2	2	1	1	1	2
4	3	4	2	1	4	4	4	2	2	1	1	1	1	6	3
6	6	1	4	1	6	1	1	6	6	1	1	5	4	1	6
6	6	2	1	1	6	2	1	5	6	2	2	1	1	1	1
5	6	1	3	1	6	1	1	6	6	2	6	6	3	1	3
4	6	3	4	2	1	1	1	5	3	5	5	4	4	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	1
4	4	5	1	1	6	1	1	6	4	2	3	3	3	1	1
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	6
4	6	1	1	1	3	2	1	3	5	2	2	1	5	2	1
5	6	1	1	1	6	1	1	6	6	3	1	1	3	1	5
4	6	1	5	1	6	1	1	6	6	2	5	5	2	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	6	1	6
4	6	1	3	3	5	1	1	6	5	3	3	2	3	1	2
4	6	2	3	1	5	1	1	6	5	2	2	3	3	1	3
3	6	4	3	4	3	4	2	4	3	4	4	3	4	1	3
5	6	1	1	1	6	1	1	6	6	1	1	2	3	1	4
6	6	1	2	2	5	2	1	5	5	2	3	1	2	2	2
5	6	5	1	1	5	1	1	5	4	2	2	1	1	1	2
4	3	4	2	1	4	4	4	2	2	1	1	1	1	6	3
6	6	1	4	1	6	1	1	6	6	1	1	5	4	1	6
6	6	2	1	1	6	2	1	5	6	2	2	1	1	1	1
5	6	1	3	1	6	1	1	6	6	2	6	6	3	1	3
4	6	3	4	2	1	1	1	5	3	5	5	4	4	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	1
4	4	5	1	1	6	1	1	6	4	2	3	3	3	1	1
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	6
4	6	1	1	1	3	2	1	3	5	2	2	1	5	2	1
5	6	1	1	1	6	1	1	6	6	3	1	1	3	1	5
4	6	1	5	1	6	1	1	6	6	2	5	5	2	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	6	1	6
4	6	1	3	3	5	1	1	6	5	3	3	2	3	1	2

4	6	2	3	1	5	1	1	6	5	2	2	3	3	1	3
3	6	4	3	4	3	4	2	4	3	4	4	3	4	1	3
5	6	1	1	1	6	1	1	6	6	1	1	2	3	1	4
6	6	1	2	2	5	2	1	5	5	2	3	1	2	2	2
5	6	5	1	1	5	1	1	5	4	2	2	1	1	1	2
4	3	4	2	1	4	4	4	2	2	1	1	1	1	6	3
6	6	1	4	1	6	1	1	6	6	1	1	5	4	1	6
6	6	2	1	1	6	2	1	5	6	2	2	1	1	1	1
5	6	1	3	1	6	1	1	6	6	2	6	6	3	1	3
4	6	3	4	2	1	1	1	5	3	5	5	4	4	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	1
4	4	5	1	1	6	1	1	6	4	2	3	3	3	1	1
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	6
4	6	1	1	1	3	2	1	3	5	2	2	1	5	2	1
5	6	1	1	1	6	1	1	6	6	3	1	1	3	1	5
4	6	1	5	1	6	1	1	6	6	2	5	5	2	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	6	1	6
4	6	1	3	3	5	1	1	6	5	3	3	2	3	1	2
4	6	2	3	1	5	1	1	6	5	2	2	3	3	1	3
3	6	4	3	4	3	4	2	4	3	4	4	3	4	1	3
5	6	1	1	1	6	1	1	6	6	1	1	2	3	1	4
6	6	1	2	2	5	2	1	5	5	2	3	1	2	2	2
5	6	5	1	1	5	1	1	5	4	2	2	1	1	1	2
4	3	4	2	1	4	4	4	2	2	1	1	1	1	6	3
6	6	1	4	1	6	1	1	6	6	1	1	5	4	1	6
6	6	2	1	1	6	2	1	5	6	2	2	1	1	1	1
5	6	1	3	1	6	1	1	6	6	2	6	6	3	1	3
4	6	3	4	2	1	1	1	5	3	5	5	4	4	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	1
4	4	5	1	1	6	1	1	6	4	2	3	3	3	1	1
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	6
4	6	1	1	1	3	2	1	3	5	2	2	1	5	2	1
5	6	1	1	1	6	1	1	6	6	3	1	1	3	1	5
4	6	1	5	1	6	1	1	6	6	2	5	5	2	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	6	1	6
4	6	1	3	3	5	1	1	6	5	3	3	2	3	1	2
4	6	2	3	1	5	1	1	6	5	2	2	3	3	1	3
3	6	4	3	4	3	4	2	4	3	4	4	3	4	1	3
5	6	1	1	1	6	1	1	6	6	1	1	2	3	1	4
6	6	1	2	2	5	2	1	5	5	2	3	1	2	2	2
5	6	5	1	1	5	1	1	5	4	2	2	1	1	1	2
4	3	4	2	1	4	4	4	2	2	1	1	1	1	6	3
6	6	1	4	1	6	1	1	6	6	1	1	5	4	1	6

6	6	2	1	1	6	2	1	5	6	2	2	1	1	1	1
5	6	1	3	1	6	1	1	6	6	2	6	6	3	1	3
4	6	3	4	2	1	1	1	5	3	5	5	4	4	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	1
4	4	5	1	1	6	1	1	6	4	2	3	3	3	1	1
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	6
4	6	1	1	1	3	2	1	3	5	2	2	1	5	2	1
5	6	1	1	1	6	1	1	6	6	3	1	1	3	1	5
4	6	1	5	1	6	1	1	6	6	2	5	5	2	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	6	1	6
4	6	1	3	3	5	1	1	6	5	3	3	2	3	1	2
4	6	2	3	1	5	1	1	6	5	2	2	3	3	1	3
3	6	4	3	4	3	4	2	4	3	4	4	3	4	1	3
5	6	1	1	1	6	1	1	6	6	1	1	2	3	1	4
6	6	1	2	2	5	2	1	5	5	2	3	1	2	2	2
5	6	5	1	1	5	1	1	5	4	2	2	1	1	1	2
4	3	4	2	1	4	4	4	2	2	1	1	1	1	6	3
6	6	1	4	1	6	1	1	6	6	1	1	5	4	1	6
6	6	2	1	1	6	2	1	5	6	2	2	1	1	1	1
5	6	1	3	1	6	1	1	6	6	2	6	6	3	1	3
4	6	3	4	2	1	1	1	5	3	5	5	4	4	1	6
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	1
4	4	5	1	1	6	1	1	6	4	2	3	3	3	1	1
6	6	1	1	1	6	1	1	6	6	1	1	1	1	1	6

PCS18	PCS19	PCS20	PCS21	PCS22	PCS23	PCS24	PCS25	PCS26	PCS27	PCS28	PCS29	PCS30	PCS31	PCS32
2	3	1	1	1	1	5	3	5	5	2	2	1	5	5
2	6	1	1	1	2	2	2	1	6	5	2	1	4	6
3	6	5	3	2	2	2	1	5	6	4	4	5	6	6
1	6	1	1	6	1	6	1	6	6	4	1	1	6	6
1	5	1	2	2	1	3	1	6	6	4	4	3	6	3
2	6	3	2	1	1	3	4	6	6	5	2	3	6	6
4	5	4	3	3	4	4	4	5	4	4	4	3	4	6
1	5	3	1	4	1	3	1	5	6	3	1	2	5	5
2	5	2	5	2	2	2	4	2	5	4	2	1	5	5
1	6	1	2	3	2	1	1	6	6	3	2	2	6	6
6	5	1	1	1	3	1	1	1	1	4	6	3	3	3
1	6	4	1	1	1	6	1	6	6	6	1	4	5	6
1	6	1	2	2	2	1	1	1	6	3	2	1	5	6
1	5	3	2	2	1	3	2	6	6	4	2	3	6	6
2	5	1	3	4	5	6	2	6	6	6	4	4	6	6
1	5	1	2	2	1	6	5	6	6	3	2	1	6	1
1	4	1	1	4	1	1	1	6	6	5	2	3	5	6
1	6	1	1	1	1	1	1	6	6	3	1	1	6	1
2	3	1	1	1	1	5	3	5	5	2	2	1	5	5
2	6	1	1	1	2	2	2	1	6	5	2	1	4	6
3	6	5	3	2	2	2	1	5	6	4	4	5	6	6
1	6	1	1	6	1	6	1	6	6	4	1	1	6	6
1	5	1	2	2	1	3	1	6	6	4	4	3	6	3
2	6	3	2	1	1	3	4	6	6	5	2	3	6	6
4	5	4	3	3	4	4	4	5	4	4	4	3	4	6
1	5	3	1	4	1	3	1	5	6	3	1	2	5	5
2	5	2	5	2	2	2	4	2	5	4	2	1	5	5
1	6	1	2	3	2	1	1	6	6	3	2	2	6	6
6	5	1	1	1	3	1	1	1	1	4	6	3	3	3
1	6	4	1	1	1	6	1	6	6	6	1	4	5	6
1	6	1	2	2	2	1	1	1	6	3	2	1	5	6
1	5	3	2	2	1	3	2	6	6	4	2	3	6	6
2	5	1	3	4	5	6	2	6	6	6	4	4	6	6
1	5	1	2	2	1	6	5	6	6	3	2	1	6	1
1	4	1	1	4	1	1	1	6	6	5	2	3	5	6
1	6	1	1	1	1	1	1	6	6	3	1	1	6	1
2	3	1	1	1	1	5	3	5	5	2	2	1	5	5
2	6	1	1	1	2	2	2	1	6	5	2	1	4	6
3	6	5	3	2	2	2	1	5	6	4	4	5	6	6
1	6	1	1	6	1	6	1	6	6	4	1	1	6	6
1	5	1	2	2	1	3	1	6	6	4	4	3	6	3

2	6	3	2	1	1	3	4	6	6	5	2	3	6	6
4	5	4	3	3	4	4	4	5	4	4	4	3	4	6
1	5	3	1	4	1	3	1	5	6	3	1	2	5	5
2	5	2	5	2	2	2	4	2	5	4	2	1	5	5
1	6	1	2	3	2	1	1	6	6	3	2	2	6	6
6	5	1	1	1	3	1	1	1	1	4	6	3	3	3
1	6	4	1	1	1	6	1	6	6	6	1	4	5	6
1	6	1	2	2	2	1	1	1	6	3	2	1	5	6
1	5	3	2	2	1	3	2	6	6	4	2	3	6	6
2	5	1	3	4	5	6	2	6	6	6	4	4	6	6
1	5	1	2	2	1	6	5	6	6	3	2	1	6	1
1	4	1	1	4	1	1	1	6	6	5	2	3	5	6
1	6	1	1	1	1	1	1	6	6	3	1	1	6	1
2	3	1	1	1	1	5	3	5	5	2	2	1	5	5
2	6	1	1	1	2	2	2	1	6	5	2	1	4	6
3	6	5	3	2	2	2	1	5	6	4	4	5	6	6
1	6	1	1	6	1	6	1	6	6	4	1	1	6	6
1	5	1	2	2	1	3	1	6	6	4	4	3	6	3
2	6	3	2	1	1	3	4	6	6	5	2	3	6	6
4	5	4	3	3	4	4	4	5	4	4	4	3	4	6
1	5	3	1	4	1	3	1	5	6	3	1	2	5	5
2	5	2	5	2	2	2	4	2	5	4	2	1	5	5
1	6	1	2	3	2	1	1	6	6	3	2	2	6	6
6	5	1	1	1	3	1	1	1	1	4	6	3	3	3
1	6	4	1	1	1	6	1	6	6	6	1	4	5	6
1	6	1	2	2	2	1	1	1	6	3	2	1	5	6
1	5	3	2	2	1	3	2	6	6	4	2	3	6	6
2	5	1	3	4	5	6	2	6	6	6	4	4	6	6
1	5	1	2	2	1	6	5	6	6	3	2	1	6	1
1	4	1	1	4	1	1	1	6	6	5	2	3	5	6
1	6	1	1	1	1	1	1	6	6	3	1	1	6	1
2	3	1	1	1	1	5	3	5	5	2	2	1	5	5
2	6	1	1	1	2	2	2	1	6	5	2	1	4	6
3	6	5	3	2	2	2	1	5	6	4	4	5	6	6
1	6	1	1	6	1	6	1	6	6	4	1	1	6	6
1	5	1	2	2	1	3	1	6	6	4	4	3	6	3
2	6	3	2	1	1	3	4	6	6	5	2	3	6	6
4	5	4	3	3	4	4	4	5	4	4	4	3	4	6
1	5	3	1	4	1	3	1	5	6	3	1	2	5	5
2	5	2	5	2	2	2	4	2	5	4	2	1	5	5
1	6	1	2	3	2	1	1	6	6	3	2	2	6	6
6	5	1	1	1	3	1	1	1	1	4	6	3	3	3
1	6	4	1	1	1	6	1	6	6	6	1	4	5	6

1	6	1	2	2	2	1	1	1	6	3	2	1	5	6
1	5	3	2	2	1	3	2	6	6	4	2	3	6	6
2	5	1	3	4	5	6	2	6	6	6	4	4	6	6
1	5	1	2	2	1	6	5	6	6	3	2	1	6	1
1	4	1	1	4	1	1	1	6	6	5	2	3	5	6
1	6	1	1	1	1	1	1	6	6	3	1	1	6	1
2	3	1	1	1	1	5	3	5	5	2	2	1	5	5
2	6	1	1	1	2	2	2	1	6	5	2	1	4	6
3	6	5	3	2	2	2	1	5	6	4	4	5	6	6
1	6	1	1	6	1	6	1	6	6	4	1	1	6	6
1	5	1	2	2	1	3	1	6	6	4	4	3	6	3
2	6	3	2	1	1	3	4	6	6	5	2	3	6	6
4	5	4	3	3	4	4	4	5	4	4	4	3	4	6
1	5	3	1	4	1	3	1	5	6	3	1	2	5	5
2	5	2	5	2	2	2	4	2	5	4	2	1	5	5
1	6	1	2	3	2	1	1	6	6	3	2	2	6	6
6	5	1	1	1	3	1	1	1	1	4	6	3	3	3
1	6	4	1	1	1	6	1	6	6	6	1	4	5	6
1	6	1	2	2	2	1	1	1	6	3	2	1	5	6
1	5	3	2	2	1	3	2	6	6	4	2	3	6	6
2	5	1	3	4	5	6	2	6	6	6	4	4	6	6
1	5	1	2	2	1	6	5	6	6	3	2	1	6	1
1	4	1	1	4	1	1	1	6	6	5	2	3	5	6
1	6	1	1	1	1	1	1	6	6	3	1	1	6	1

PCS33	PCS34	PCS35	PCS36
2	5	4	1
2	3	5	3
4	5	4	1
1	6	6	1
2	3	3	1
2	3	4	1
4	6	3	3
1	5	5	1
3	4	5	2
2	1	4	2
1	6	6	0
1	4	6	1
1	4	5	1
2	3	5	1
5	4	2	4
1	5	5	1
2	3	3	1
1	6	6	1
2	5	4	1
2	3	5	3
4	5	4	1
1	6	6	1
2	3	3	1
2	3	4	1
4	6	3	3
1	5	5	1
3	4	5	2
2	1	4	2
1	6	6	0
1	4	6	1
1	4	5	1
2	3	5	1
5	4	2	4
1	5	5	1
2	3	3	1
1	6	6	1
2	5	4	1
2	3	5	3
4	5	4	1
1	6	6	1
2	3	3	1

2	3	4	1
4	6	3	3
1	5	5	1
3	4	5	2
2	1	4	2
1	6	6	0
1	4	6	1
1	4	5	1
2	3	5	1
5	4	2	4
1	5	5	1
2	3	3	1
1	6	6	1
2	5	4	1
2	3	5	3
4	5	4	1
1	6	6	1
2	3	3	1
2	3	4	1
4	6	3	3
1	5	5	1
3	4	5	2
2	1	4	2
1	6	6	0
1	4	6	1
1	4	5	1
2	3	5	1
5	4	2	4
1	5	5	1
2	3	3	1
1	6	6	1
2	5	4	1
2	3	5	3
4	5	4	1
1	6	6	1
2	3	3	1
2	3	4	1
4	6	3	3
1	5	5	1
3	4	5	2
2	1	4	2
1	6	6	0
1	4	6	1

1	4	5	1
2	3	5	1
5	4	2	4
1	5	5	1
2	3	3	1
1	6	6	1
2	5	4	1
2	3	5	3
4	5	4	1
1	6	6	1
2	3	3	1
2	3	4	1
4	6	3	3
1	5	5	1
3	4	5	2
2	1	4	2
1	6	6	0
1	4	6	1
1	4	5	1
2	3	5	1
5	4	2	4
1	5	5	1
2	3	3	1
1	6	6	1

VITAE

Name of Author: Belinda A. Casimir

Address: 2621 Green Oaks Drive
Montgomery, Alabama, 36107

Telephone Number: (334) 649-4461

EDUCATION

Master of Science – Troy University, Montgomery, Alabama, 2010.
Major: Computer Science

Bachelor of Science – Plattsburgh State University, Plattsburgh, New York, 2005.
Major: Computer Science
Minor: Mathematics

EMPLOYMENT AND TEACHING EXPERIENCE

College Education Teaching, Virginia College. 2010- Present. Teach entry level college spreadsheet online courses.

Secondary Education Teaching, Saint James School. 2006- Present. Teach high school Computer Applications, Introduction to Programming and Advanced Computer courses.

Secondary Education Teaching, Brewbaker Junior High School, 2005-2006. Taught mathematics for one year in a Seventh grade classroom.

Internship, Clinton County Department of Social Services, 2005. Created course lesson plans for college instructor, created visual basic tutorials and assisted in network wiring.

Tutoring, Sylvan Learning Center, 2005. Tutored high school and middle school students in areas of Mathematics, English and Science.