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Pepperdine University
Graduate School of Education and Psychology

PERSONALITY TYPES AS AN INDICATOR OF ONLINE STUDENT SUCCESS
AND RETENTION

A dissertation submitted in partial satisfaction
of the requirements for the degree of
Doctor of Education in Educational Technology

by

Ben P. Meredith

April, 2011

Farzin Madjidi, Ed.D.—Dissertation Chairperson

This dissertation, written by

Ben P. Meredith

under the guidance of a Faculty Committee and approved by its members, has been submitted to and accepted by the Graduate Faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

Doctoral Committee:

Farzin Madjidi, Ed.D., Chairperson

John F. McManus, Ph.D.

Paul Sparks, Ph.D.

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TABLE OF CONTENTS

	Page
LIST OF TABLES	vii
LIST OF FIGURES	viii
DEDICATION	ix
ACKNOWLEDGEMENTS	x
VITA	xii
ABSTRACT	xiii
Chapter 1: Introduction to the Study	1
Background to the Problem	1
The Student Retention Question	2
The Economics of Student Retention	3
The Online Course Invasion	4
The Online Competition	5
The Moral Issue of Retention	7
The Online Retention Rates	7
Personality as a Determinant	9
Statement of the Problem	10
Purpose	10
Research Questions	11
Definition of Terms	12
Assumptions	14
Organization of the Study	15
Chapter 2: Review of Related Literature	16
What is Distance Education?	17
The State of Current Research on Distance Education Students	19
Demographics	20
Learning Outcomes	20
Student Attitudes, Satisfaction, Retention, and Attrition	22
Personality Research and Computers	25
Foundation of Personality Typing	26
Perceiving: Sensing and Intuition	27
Judging: Thinking and Feeling	28
Combining Perception and Judgment	29
The Extraversion-Introversion Preference	30

	Page
The Judgment-Perception Preference	31
The Dominant and Auxiliary Processes.....	32
Personality Types and Computers	33
Personality Types and the Computer Professions.....	34
Personality Types and Computer Attitudes	36
Personality Types, Gender, Demographics, and Computer Instruction.....	38
Personality Types and Student Grades	43
Personality Research Tool Compatibilities.....	45
16PF test.....	45
Correlations between the MBTI, the 16PF, and the KTSII	47
The KTSII	47
The 16PF and MBTI/KTSII E/I Factor.....	50
The 16PF and MBTI/KTSII S/N Factor	50
The 16PF and MBTI/KTSII T/F Factor.....	51
The 16PF and MBTI/KTSIIJ/P Factor.....	51
Summary of Literature Findings and Possible Relationship to Current Study.....	51
 Chapter 3: Research Design and Methods.....	 54
Previous Findings.....	54
Research Questions.....	56
Setting.....	56
Participants.....	58
Inclusion criteria	58
Exclusion criteria	59
Unit of Analysis and Population Size.....	59
Courses for the Study.....	59
Instruments.....	60
Keirsey Temperament Sorter II (KTSII).....	60
Academic Information From the School Records	62
Data Collection	62
Inviting participants	62
Survey	63
Protection of Human Subjects	65
Data Analysis.....	65
Limitations of the Study.....	67
Summary	68
 Chapter 4: Results.....	 69
Demographics Descriptive Analysis.....	72
Additional Statistics.....	76
Findings.....	77
Summary	84

	Page
Chapter 5: Discussion	86
Methodology	89
Limitations	90
Demographic Findings.....	94
Temperament Findings	96
Temperaments in Success and Retention.....	97
Implications for Distance Learning	104
Conclusion	106
REFERENCES	108
APPENDIX A Initial Participant E-Mail.....	117
APPENDIX B Participant Consent Form.....	120
APPENDIX C Keirsev Temperament Sorter Survey Questions	122

LIST OF TABLES

	Page
Table 1. Keirsey's the history of four temperament patterns through the ages	48
Table 2. Keirsey's archetypes.....	49
Table 3. Keirsey's personality types and temperaments.....	61
Table 4. Keirsey's 32 mixed personality types.....	61
Table 5. Data collection example spreadsheet.....	62
Table 6. Analysis of Variance Table	77
Table 7. Course Final Numeric Scores	78
Table 8. KTS Personality Types and Retention States	79
Table 9. Chi-Square and Individual Temperament Characteristics	81
Table 10. Demographic Profile of Successful Online Students	82
Table 11. Demographic Profile of Retained Students	82
Table 12. ANOVA for Number of Children and Age of Online Students and Retention .	83
Table 13. Chi-Square Analysis of KTSII Elements and Retention	84

LIST OF FIGURES

	Page
Figure 1. Olympic College online class enrollment.....	58
Figure 2. Keirsey’s eight personality factor groupings.....	60
Figure 3. Gender distribution of participants.....	72
Figure 4. Age distribution of participants.....	73
Figure 5. Ethnicity distribution of participants.....	73
Figure 6. Marital status distribution of participants.....	74
Figure 7. Distribution of number of children of child care age.....	74
Figure 8. Household income distribution of participants.....	75
Figure 9. Temperament distribution of participants.....	76
Figure 10. Grade distribution by percentage.....	77
Figure 11. Grade mean of participants by temperament.....	79

DEDICATION

To my muse, my best friend, my confidant, and the one who has been there for me through the best and the worst of this research, this work is dedicated to my wife:

Michelle

ACKNOWLEDGEMENTS

No person is an island and no substantial endeavor is ever achieved in solitude. While it would be heroic to think that this research was done in solitude through hard work and dedication by one man, it would be far from the truth.

I would first like to acknowledge and thank my wife, Michelle, and my daughters. In the first week of the doctoral program, it was explained that this undertaking was a family event; that all of the members of our families would be the ones to endure as much or more of this program as we did. We were told that graduating and the ceremony of hooding was more for the families and what they contributed than for the person having gone through the process. At the other side of this process there are no truer words. My wife and daughters tolerated far more than anyone in this and I thank them for staying with me.

I thank Dr. Farzin Madjidi of Pepperdine University, my mentor and friend. Even being in the academic arena I have seldom met or worked with an educator with a more gentle and mentoring style that motivates. When I had all but thrown in the towel in this process, it was Farzin who put perspective on it and helped me through. I value his leadership, caring approach, and his friendship. He had confidence in me when I lost mine and he was a voice of reason and of vision on what this research was about.

As with too many projects that take too long to finish, some of the original members are replaced by late comers. Dr. John McManus and Dr. Paul Sparks were those two. Valuing the research I had done and conducted, they offered their hands and experience to finishing this project. I am deeply appreciative of their confidence and value in me. During my defense of this research, they “got it”. They shared my vision and

saw the same future for this research that I had. As latecomers to the research, their perspectives were fresh and reaffirming. The later conversations they provided have been invaluable and uplifting.

Finally, I want to extend an appreciation to one person who, while not a part of this research, was instrumental at every step of my journey. Dr. Linda Polin first interviewed me for the Educational Technology doctoral program and welcomed me into it. During my course time, she served as a guide—I always felt she had a watchful and caring eye on my progress. She conducted my exit exams 2½ years later—the midpoint check-in on my journey. And as I closed out my research, she was there to provide final guidance on where my path may lead after this portion of the journey is done.

VITA

Doctor of Education, Educational Technology Pepperdine University, Culver City, California	2010
Master of Arts, Political Science Indiana University, Bloomington, Indiana	1994
Master of Arts, West European Area Studies Indiana University, Bloomington, Indiana	1993
Bachelor of Arts, History Youngstown State University, Youngstown, Ohio	1983

ABSTRACT

With online education courses within public institutions realizing lower than average retention and success rates for students, current retention practices and models are falling woefully short of providing workable, viable answers to keeping students and helping them be successful without lowering academic standards. While a relationship between specific occupations and personality types have been noted, currently little research exists linking personality type with online student success and retention. This study sought to determine the relationship between the personality types of online students and their success and retention in online programs.

In summer 2009, 149 students from Olympic College in Washington State participated in 2 surveys, the Keirsey Temperament Sorter II and a demographics detail survey. An ANOVA was conducted to determine if personality has an influence on student success in online courses. Chi-Square analysis was conducted on the 16 KTS personality types and retention states to determine if personality has an influence on higher retention rates in online courses and to determine if there was a difference in retention based on temperament elements. ANOVAs and *t*-tests were conducted, as appropriate, to determine if demographic factors' influence online student success. Chi-Squares were conducted on each of 4 factors in the study—gender, ethnicity, marital status, and household income—to determine if demographic factors influence student retention in online courses (participating in more than 1 online course over a 3-term period). And a *t*-test was conducted on age and number of children of child care age in the home.

Personality was found to be an influencing factor in online student success with 4 temperaments more likely than all others to be successful based upon final course grade. Personality was also found to be an influencing factor in online student retention. Among the temperament elements, Feeling/Thinking was found to have an influencing effect on student success.

While demographically online program marketers are being successful with attracting the nontraditional Guardian temperament as a student, the results of this study indicate that these students may not be the best suited for success in the online environments.

Chapter 1: Introduction to the Study

Background to the Problem

With the advent of the World Wide Web and an almost universal e-mail access for middle-class citizens in the industrialized states, educators and administrators have begun to examine or embrace this accessibility phenomenon to increase the learning experience or to reach out to new students. A plethora of articles, essays, books, journals and “how to” pieces have flooded the academic arena about distance education.

While there is a large volume of recent material about distance education, little of it is original research, and most of this is of questionable quality. A closer look at this research shows that it falls into three major categories: Student Outcome, Student Attitudes toward Distance Education in General, and Student Satisfaction with DE in General (Institute, 1999).

For the most part, these studies conclude that Internet-based distance education is not significantly different from classroom experiences, and that students’ performance in distance education courses is as high as students’ performance in traditional courses (Diaz, 2000, 2002; Russell, 1999). If a researcher can divine one general tone from all of this early literature, it would be the sense of a cheering squad for distance education rather than an understanding of it. Instead of gaining an appreciation of how to design effective courses and instruction, what pedagogic model best applies to online education or what elements are necessary to retain students and develop the academia community, the early research and writings’ emphasis has been upon demonstrating Russell’s (1999) contention of “The No Significant Difference Phenomenon” between distant education and traditional classroom work. Yet, since its most recent modality on Internet-based

online instruction, lower than normal student retention rates and the lack of clear research toward understanding this retention phenomenon have been present.

Studies of distance education repeatedly indicate that students participating in distance education courses of all types are more likely to drop out or not complete the course. In one study reported by Powell, Conway and Ross (1990), while 81% of the students finishing the course passed, only 40% of those beginning the course finished. In another study for the California State University Chancellor's Office, Jewitt (1997) reported that 33% of the students in a video conferencing class received an "incomplete" grade, while 15% of the students in the on-campus version of the same course received an "incomplete." In a study comparing student performance and attitude between traditional and computer conferencing classes, Cheng, Lehman, and Armstrong (1991) reported finding that courses delivered through distance education had significantly higher incompleteness rates (32%) than their on-campus counterparts (4%). More alarming, Carr (2000) reported that some institutions are seeing less than 50% of students completing online courses, and McVay-Lynch (2002) reported rates as high as 75% of students not completing Web-based courses. Repeatedly, research has shown that distance education courses have consistently higher drop rates than traditional college courses (Diaz, 2000; Phipps & Merisotis, 1999; Ridley & Sammour, 1996). As higher education looks to online instruction for any number of reasons, student retention in these courses must be foremost on its agenda. But this prompts an initial question, "Why should anyone care about student retention?"

The Student Retention Question

Student retention has a number of facets that are significant to any college or university. First, is the economics of student retention, specifically the tying of funding

and money to retaining students in courses and specifically in *our* institution. Second, is the reputation of the institution for its caring and concern for the welfare of the students. Third, is the issue of educational ethics, specifically the ethical issue of teachers to nurture and teach, and student retention as a measure of this. Finally, there is the issue of academic community success and student retention as a measure of this.

While institutions may be aware of these issues surrounding student retention in online courses, the factors that increase student retention in online classes is still open for debate and interpretation. Are specific students predisposed to a higher retention rate in online courses than others? Does online instruction prompt success within a specific type of student over others and is this tied to student retention? Does online instruction call out for matriculation just as institutions do for other courses?

The Economics of Student Retention

For many outside of education, student retention and economics may seem disconnected. However, university and college subsidy is directly tied to student retention. As state and national funding continue to decline in the economy through the first and second decade of 2000, universities and colleges are forced to increasingly rely on attracting and keeping students, and their important tuition, to maintain operating budgets. In his report to the National Center for Public Policy and Higher Education, Hovey (1999) predicted:

even with normal economic growth over the next eight years, the vast majority of states will face significant fiscal deficits. Given past state budget patterns of coping with fiscal deficits and avoiding tax increases, the report concludes that the projected shortfalls will lead to increased scrutiny of higher education in almost all states, and to curtailed spending for public higher education in many states. (para. 1)

Hovey's predictions, now several years old, are hauntingly accurate. In California, the state hardest hit by the deflation of the Dot.Com balloon, the state is operating billions in the red and the governor eyed community colleges as a potential area to make up the differences (Evelyn, 2003). Likewise, in the post-9/11 world and with the added unpredictable costs of the war in Iraq, President Bush announced proposed cuts in federal funding of grants to students and higher education to offset the cost of the war (Farrell, 2002). Distance Education has come to the forefront for funding-desperate administrators to help offset these and other financial dependence woes since 1996. Online learning, in conjunction with the growth and pervasion of the Internet, quickly became the prime delivery system of choice and has infiltrated the majority of higher education institutions.

The Online Course Invasion

In its report, "Distance Education at Postsecondary Education Institutions: 2006-2007", the National Education Association (NEA) stated that during the 2006-2007 academic year, 66% of 4-year public schools and 62% of 2-year public schools used distance education(online, hybrid/blended, or other distance delivered courses. These distance courses had an estimated 12.2 million enrollment of which 89% were online or hybrid/blended that included an online component (NEA, 2008). Not surprisingly, the prospect of luring students to campuses virtually from anywhere and overcoming the limitations of geographically bound campuses and their associated housing, feeding, etc. is appealing to many administrators.

Two instances of large enrollment increases in online environments are the University of Illinois—Springfield (UIS) and St. Leo University (SLU; Lorenzo, 2002). Both of these schools are an extreme example of online learning enrollment increases. UIS saw an increase of 2,960% enrollment in its online course offerings from Fall 1998

to Fall 2001 (Lorenzo, 2002). SLU grew from 12 students in Fall 1998 to 2000 students Fall 2000—a 16,567% enrollment. Michael Rogich, Director of SLU’s Center for Online Learning, stated, “...we are growing at about six to eight percent every eight weeks” (Lorenzo, 2002, para. 17).

While these are impressive and seductive numbers to any administrator looking to increase student enrollment, there are more failures in the online offering world. In her *New York Times* article on the painful lessons universities and colleges have had to endure in the process of starting up online offerings, Katie Hafner wrote that the “groves of academe are littered with the detritus of failed e-learning startups as those same universities struggle with the question of how to embrace online education but not hemorrhage money in the process” (Hafner, 2002, para. 11).

Lev S. Gronick, Case Western Reserve University’s Vice President for Information services and Chief Information Officer, claims, “University presidents got dollars in their eyes and figured the way the university was going to ride the Dot-com wave was through distance learning” (Hafner, 2002, para. 9). Gronick goes on to add that e-learning technology has largely failed. “Across U.S. campuses today, e-learning technology investments are at risk, and many technology champions are in retreat” (Hafner, 2002, para. 14). One possible reason for this failure is the new element of competition that universities previously did not have to answer to on such an immediate and global scale. The very same global reach that held the promise of greater student enrollments places universities into a new competition against other schools.

The Online Competition

In the past—and not so distant past—family and job constraints, geography or economics limited students to nearby or regional universities or colleges. With the advent

of web-based online course offerings, students are no longer constrained by daily life or geography. With literally hundreds of offerings in courses, professors, schools and prices, students can now return to school or work school into nontraditional schedules and achieve their education goals. Universities and colleges have responded to this new demand. This is much different from the prior academic recruiting world, where universities and colleges were somewhat assured of little to no competition for local students. Now universities and colleges are forced to contend with the reality that the other schools in their region are not their only competition for students and their important tuition dollars. While the Internet allows schools the opportunity to enroll more students from outside their immediate area, this opportunity also allows other schools to do the same. The result is that with the global expansion of competition for these students, institutions now have a larger task at recruiting and keeping students.

In spite of this globalizing education system, universities and colleges are continuing to move toward online education, whether it generates real revenue and improves enrollment or not. In 2002, it was hard to find a university or college that did not offer some form of online learning or distance education. The California Community College's 2001 *Distance Education Report* reported that between 1998 and 2000, Internet based courses increased by 238%, going from 328 sections to 1001 (Morrow et al., 2001). In Washington State between 2005 and 2009, state headcount enrollment in online courses rose 155% from 63,407 to 98,314 (Washington State, 2010).

Unquestionably, universities and colleges are looking to online education as a means to shore up the dwindling funding sources to maintain budgets. Since higher education has committed so much to online education, it would follow that retaining students once online is in the best financial interests of the university.

The Moral Issue of Retention

Vincent Tinto, a leading researcher in student retention at Syracuse University, argues that the values that exist in higher education to serve the students are important and stresses responsibility and obligation as the reasons for society and institutions to care about retention (Tinto, 1993). Likening this sense of responsibility and obligation to other human communities, Tinto (1997) states, “The social affiliations that those activities provide serves as a vehicle through which academic involvement is engaged” (p. 7). He has repeatedly pointed to courses and programs based upon guiding principles and values as being more likely to retain students. Therefore, student retention is not a side concern as much as it is the educational experience for which universities and colleges strive. The more endearing the educational community development and the educational experience, the more likely students will be to remain semester after semester with the same institution, and the greater their learning (Tinto, 1997).

The Online Retention Rates

Carr in her February 2000 article in *The Chronicle of Higher Education* reported:

Although there is significant variation among institutions with some reporting course-completion rates of more than 80 percent and others finding that fewer than 50 percent of distance-education students finish their courses, several administrators concur that course-completion rates are often 10 to 20 percentage points higher in traditional courses than in distance offerings. (p. A 39)

While Carr’s article refers generically to “distance education” courses and does not specifically address online learning, McVay-Lynch (2002) wrote, “By 1997 the majority of U.S. colleges and universities were reporting averages ranging from 30 percent to 75 percent of students not completing Web-based courses” (p. 12).

Since no national statistics exist at the moment looking specifically at the online student retention phenomenon, researchers are left with anecdotal evidence and informal

studies. Out of seven studies gathered concerning community college online course retention (Crabtree, 2000; Cutler, 2000; Mesa Community College, 2001; Morrow, 2001; Valdez, 2001), Washington State community colleges and technical schools reported the highest retention rate of 71% for a single term (Spring 2001) and the highest averaged retention rate over a three-year period representing Spring Terms 1999, 2000, and 2001 at 68% (Valdez, 2001). In spite of these seemingly high retention rates, however, these same Washington community colleges and technical schools remain 12% below their on-campus averaged retention rate of 83% over a three-year period. The average retention rate for all community colleges in the research report (Valdez, 2001) was 58%; 16 percentage points below the 74% retention average for community college on-campus courses. Within the Washington community and technical college system, Bellevue College undertook a longitudinal study on online student success and retention patterns. Bellevue College reports Aggregated at the college level, online student retention increased from 72% in ACY00-01 to 77% in ACY06-07. The gap between on-campus retention and online retention continued to decrease over the last few academic years, with online retention lagging on-campus retention by 6.6% in ACY06-07. (Royer, 2007). While this is not best-of-all-worlds-data to use as a base of comparison, it is all that research can currently extrapolate from the available data, is a comparable western state, and is the best that one can use at this point.

In spite of the growth of the online programs, student retention and success rates for online courses are still abominably poor. Despite the argument that online courses are “as good as” (Russell, 1999) traditional courses, these numbers are bringing into question whether or not schools are doing the best they can for their students in the way they provide online education, student support and student preparedness. More frighteningly,

some academicians have moved to argue that due to its low retention rates, online education should disqualify as an alternative option to traditional education.

Personality as a Determinant

Several researchers have looked at various indicators/predictors of student success in distance and online education (Biner, Bink & Huffman, 1995; Biner, Dean & Mellinger, 1994; Carr, 2000; Center for the Study of College Student Retention, 2003; Crabtree, 2000; Cutler, 2000; Diaz, 2000, 2002; MacGregor, 2000, 2002). In their 1995 study on telecourses, Biner et al. suggested that universities and colleges implement a personality test in matriculation to identify students who are likely to do well in telecourses. Biner et al. (1995) found that differences in personality between successful telecourse students and traditional course students existed.

Building from the research of Biner et al. (1995) but focused on the newly emerging World Wide Web-based courses, MacGregor (2002) found similar patterns between personality types in online courses and those in traditional courses. MacGregor's findings contradict a study by Stokes (2001) that found personality as an insignificant determinant of online student success. This left the question of the role of personality in online student success and retention open for debate and further research.

While not specifically looking at student retention, Ellis (2003) found that patterns in student attitudes toward online threaded discussions and personality type did exist along specific dimensions that demonstrated a higher positive attitude and a greater online participation than others. This provides an indication that certain personality types may be more predisposed to online learning and interaction than others.

While the relationship between specific occupations and personality types have been noted (Briggs, Myers, & Myers, 1980; Kroeger & Thuesen, 1988; Myers &

McCaulley, 1985), little research exists establishing possible relationships between successful online students and personality. Even less research is available determining a relationship between personality and online student retention. In spite of a lack of empirical evidence, low success and retention rates have been associated with online course work (Carr, 2000; Diaz, 2000, 2002; McVay-Lynch, 2002; Valdez, 2001). The possibility of a relationship between personality type and successful and retained online students has not yet been ruled out or clearly established through research.

Statement of the Problem

In looking at the low retention and success rates of online courses and the supporting literature on the subject reaffirming that this condition is more universal than unique, the need for this study becomes evident. Current models of traditional student retention do not address the new phenomenon of online courses, yet this delivery system has quickly become an expected feature of higher education in the United States (NEA, 2000). Even more, administrators are looking to online education as a means to attract more students whose tuition could offset limited state and federal funding. Yet, current retention practices and models are falling woefully short of providing workable, viable answers to these low retention rates. Thus the problem becomes identifying factors in common in successful and retained students in online courses. As such, little is known about factors common among successful and retained students. Such knowledge can help alleviate these new challenges.

Purpose

While there is still no plethora of studies or of empirically based research on the problem in the academic world at the moment, the number of studies proposed and in the works concerning the issue of student retention as evident by a simple Internet search and

examination of the “Student Retention Listerv” administered by the *Journal of College Student Retention* shows a significant interest in the topic is developing. For administrators, the cost of online education is significant in itself so that any information that will be helpful in retaining students and increasing the return-on-investment for online education is important. For instructors, they are inundated with discussion on the proper pedagogic model to use for online instruction (Hanna, Glowacki-Dudka, & Conceição-Runlee, 2000; Palloff & Pratt, 1999; Wonacott, 2000), but we are woefully short of anything more than anecdotal evidence on the effectiveness of these models. And, for students, the lack of an empirically based effective model for online success leaves little room for good counseling or advice beyond trial and error.

Further, in identifying these elements, institutions may be able to better advise and counsel students on their likelihood of doing well in online courses of various pedagogic models, measured in retention, satisfaction and learning. In this alone, the value of studying persistent online student personality types to improve the retention of online students becomes apparent. Accordingly, this study seeks to determine the relationship between the personality types of online students and their success and retention in online programs.

Research Questions

- Are certain online students more likely to succeed in the online format as a function of their personality factors; that is, is there a difference in personality factor score for each of the eight KTS personality types based on degree of success in the course?
- Are specific online students more likely to have a higher retention rate in online courses as a function of their personality factors; that is, is there a

difference in personality factor score for each of the eight KTS personality types based on degree of retention in the course?

- What is the demographic profile of a successful online student?
- What is the demographic profile of a retained online student?

Definition of Terms

Asynchronous Chat—Communication or information exchange wherein both parties are not necessarily on the Internet at the same time in the same Web space. E-mail, newsgroups, mailing lists, Web-based bulletin boards or Web-based online forums are the notable communication tools in this category (DiStefano, Rudestam & Silverman, 2004).

Distance Education—A general category of education wherein the instructor and student are geographically separated (DiStefano et al., 2004; Keating & Hargitai, 1999; Palloff & Pratt, 1999; Wolcott, 1998). Also distance education is called distance learning or distributive education.

Distance Learning—A general category of education wherein the instructor and student are geographically separated (DiStefano et al., 2004; Keating & Hargitai, 1999; Palloff & Pratt, 1999; Wolcott, 1998). Also distance learning is called distance education or distributive education.

Distributive Education—A general category of education wherein the instructor and student are geographically separated (DiStefano et al., 2004; Keating & Hargitai, 1999; Palloff & Pratt, 1999; Wolcott, 1998). Also distributive education is called distance education or distance learning.

Dropping a Course—A student or instructor initiated termination of a student from a course that will generate no record of the student having enrolled in the course on

the student's transcripts. Generally, these records are not present after a college specified date in the term and are not noted in college held records after that date.

Online Education or Course—A specific subset of distance education that is delivered and received via the Internet (DiStefano et al., 2004; Keating & Hargitai, 1999; Palloff & Pratt, 1999; Wolcott, 1998). It does not denote courses delivered by CD-Rom, DVD or flash drive that are coded in HTML and therefore viewable through a web browser without connection to the Internet.

Retained—Participants will be considered retained in online courses if they have completed two or more nonduplicate online courses within a three term period.

Retention Rate—the number or percentage of students who stayed in a class the entire term and did not drop or withdraw from the course. It is calculated as: $(a+b+c+d+f+cr+nc+i)/(a+b+c+d+f+cr+nc+i+w)$. Each letter above stands for the number of students receiving that grade at the end of the course.

Synchronous Chat—Communication or information exchange wherein both parties are interacting at the same time in the same place. In the online environment, this denotes both parties being on the Internet at the same time in the same Web space. Chat rooms, whiteboards, avatars, and instant messaging are the notable communication tools in this category (DiStefano et al., 2004).

Success—Success for the course will be measured by the participant's final course grade. Students with final grades of A, B, C or S or the corresponding +/- grade for each of these will be considered successful in their course for the purposes of this study. Students with final grades of D, F, N, W or I will be considered unsuccessful in their courses for the purposes of this study. The cooperating university uses the conventional letter grading system for final grades. The cooperating university

additionally uses the letters “W” for withdrawal from a course and “I” for incomplete. Students in the participating university may also receive an “S” or “N” for satisfactory and nonsatisfactory respectively when taking the no-grade option in the course.

Success Rate—The number or percentage of students who completed the course successfully. It is calculated as: $(a+b+c+cr)/(a+b+c+d+f+cr+nc+i+w)$. Each letter above stands for the number of students receiving that grade at the end of the course.

Traditional—Any course or student that meets with the instructor in a classroom on a university or college campus. Traditional classes are also called face-to-face (F2F).

Withdrawal From a Course—A student-generated termination from a course after a specific date that will generate a “W” grade on the student’s permanent transcripts. The student grade will often be denoted with a “W”.

Assumptions

This study is based upon the following assumptions:

1. Online/distance education is a viable medium for education and will remain so for the foreseeable future.
2. Online course retention rates are lower than traditional on-campus course retention rates.
3. Online courses are not for all students, which pre-supposes that an identifiable characteristic in online students that is not present in traditional students exists.
4. Persistent online students, and those that select online learning, have identifiable characteristics that predispose them to persist in online education.

Organization of the Study

- Chapter 1 describes the problem, its background, the purpose of the study, the research questions, the assumptions going into the research, the limitations of the research and the organization of the study
- Chapter 2 provides a review of the literature to identify current retention models, to provide a clear understanding of the work and findings of Jung, Myers-Briggs and Myers, and Keirsey and Bates on personality typology, and to examine current understandings of the connections between personality types and computers.
- Chapter 3 describes the methodology for the study. This is a quantitative study.
- Chapter 4 reports the findings of the study.
- Chapter 5 contains the summary, conclusions, and recommendations on online student personality types and their connection to retention of online students.

Chapter 2: Review of Related Literature

Since the advent of the World Wide Web and an almost universal e-mail access for middle-class citizens growing in the industrialized states, educators and administrators have begun to examine or embrace this accessibility phenomenon to increase the learning experience and to reach out to new students. An excess of articles, essays, books, journals and “how to” pieces have flooded the print media arena about distance education.

While there is a large volume of recent material about distance education, a closer look at this research shows that most of it falls into three major categories: Student Outcome, Student Attitudes toward Distance Education in General, and Student Satisfaction with Distance Education in General (Institute, 1999). For the most part, these studies conclude that Internet-based distance education is “as good as” classroom experiences, and that student’s performance in distance education courses is as high as students performing in traditional courses (Russell, 1999). If one can divine a general tone from all of this literature, it would be the sense of a cheering squad for distance education rather than an understanding of it. Instead of gaining an empirically based appreciation of how to design effective courses and instruction, the research and writings’ emphasis has been upon demonstrating Russell’s (1999) contention of The No Significant Difference Phenomenon between distant education and traditional classroom work. Yet since the recent addition of online delivery this mode has continually shown a pattern of lower than normal student retention rates and the writings on this new delivery mode have shown the lack of clear research toward understanding the low retention phenomenon.

This chapter will examine the current research on identifying differences between online students and traditional ones, and establish a basis for research of successful and retained online student personality types as a determinant of online student success and retention. To do this, one must define distance education more fully and appreciate the current findings from research on distance education students. Next, this chapter will examine current understandings and research on personality types and their relationship to computer related professions first, their relationship to attitudes toward computers, and finally their relationship to student grades. In the process of that discussion will be an examination of personality typing and types and a look at the existing research on the relationship between computer instruction and gender, between computer instruction and demographics, and the current initial research between computer instruction and personality types. After discussing the various personality research tools and their compatibility with each other's findings, the chapter will conclude with a discussion on the relationship between the current literature's findings and this present study.

What is Distance Education?

The term *distance education* has truly become a general term. Through the late 19th century and most of the 20th century when the only means of distant communication was the postal service, distance education was synonymous with correspondence courses. These marked a first generation of distance education. Through normal postal correspondence, individual interaction with the content, and a healthy dose of time and confusion, these courses opened up new access points to education. While even in their height they were never a lion's share, or a cub's share, of the academic world, these slow, cumbersome, linear programs marked an attempt by universities to project education to wider geographically separated areas.

With the advent of radio, the phonograph, and television, distance education came to include these mediums as methods of instructional delivery. While this second generation of distance education brought sight and sound to the student, the instructional strategy of linear progression, slow remote communication between student and instructor, the lack of student to student contact, and delayed feedback to students remained as much a part of the courses as ever before.

By the 1980s, television and satellite communication advances would allow for the next inclusion into this general category of education delivery. Interactive television (ITV) in all of its broadcast forms—satellite, microwave, single broadcast, etc.—offered students the opportunity to receive instruction and interact with the course instructor in real time (or at least as real as the technological glitches would allow). Unlike previous distance education courses, ITV allowed for faster feedback, greater interaction between student and instructor, some student-to-student interaction, and for the first time a pseudo-sense of belonging to a learning group for a student. Whereas previous technologies allowed for teacher-student interaction, it was physically and technically unable to provide students with a sense of community, of other students being in the course, and a sense of belonging, ITV now allowed at least the ability for a student to recognize the existence of others in the course. And dependent upon the instructional design of the course, it could allow for limited student-to-student interaction. With the opening of the World Wide Web and the release of a mass-market-usable HTML (Hypertext Mark-up Language) reader—now commonly called a “browser”—distance education increased its scale to include yet another mode of delivery.

With each of these generations and modes of instruction still prevalent, the term “Distance Education” may be taken as a general category of education wherein the

instructor and student are geographically separated (Keating & Hargitai, 1999; Palloff & Pratt, 1999; Wolcott, 1998). Because of variations in the technology, the instructor and student may interact either synchronously or asynchronously or through a combination of both. The concerns in this study focus upon only one of the delivery modes in this category, online delivery.

The State of Current Research on Distance Education Students

Current research literature on distance education is varied, but not overly extensive. In general terms, studies have been attempted to understand high student attrition rates (Jewitt, 1997; Malony, 1999; Merisotis, 1999; Merisotis & Phipps, 1999; Powell, Conway, & Ross, 1990; Schlosser & Anderson, 1994), demographic variables between traditional students and distance education students (Dille & Mezack, 1991; Richards, 1992; Sparks, 1997; Thompson, 1998), student attitudes toward their distance education experiences (Higgs, 1995; Savard, Mitchell, Abrami, & Corso, 1995; Schlosser & Anderson, 1994), levels of student participation in Distance Education classes (Hanson, et al. 1997; Higgs, 1995; Powers & Mitchell, 1997; Wegreif & Mercer, 1996), learning outcome variables between distance education and face-to-face classes (Dille & Merzack, 1991; Institute, 1999; Russell, 1999; Westbrook, 1999), and learning style importance for distance education students (Higgs, 1995). For the overwhelming majority of these studies, there was no distinctly defined online delivery method studied. Rather the studies predominantly looked at all forms of distance education. Further, and in large part due to the dates of the studies, online education was not specifically studied until studies after 1999, which rely upon nononline distance education methods.

Subsequent literature reviews have asserted that much of the research in distance education is of a “media comparison type” (Schlosser & Anderson, 1994, p. 29) and that

much of the research in DE falls into three major categories: student outcome, student attitudes toward distance education in general, and student satisfaction with distance education in general (Institute, 1999).

Due in part to the small scale of most of these studies, their over reliance on case studies, their questionable methods, and their predominant focus on online instructor experiences and the experiences of institutions attempting to develop and provide online programs, a good portion of the current research has been criticized (Institute, 1999; Merisotis, 1999; Merisotis & Phipps, 1999; Schlosser & Anderson, 1994). Still, taken together, one can begin to develop a picture of the distance education phenomenon that can serve as a jump off point of understanding for the distance education world.

Demographics

In Thompson's (1998) review of research literature to that point, the typical distance learner (all forms of distance education were considered) is older than the typical undergraduate, female, more likely to be employed full-time, and married. While Thompson (1998) found that the "traditional" distance education student had difficulty attending college because of geographic remoteness, he also found this caricature is changing. Thompson indicated that more students are choosing distance education without consideration to their proximity to campus. This may lead to speculation that distance education modes are less for "distance" and that other factors may be involved in student selection of this mode. Subsequent studies have confirmed this general demographic finding (Diaz, 2000, 2002; Diaz & Cartnal, 1999; MacGregor, 2000, 2002).

Learning Outcomes

Again embracing all distance learning formats, a good number of studies found that there were no outcome disadvantages to distance education from traditional face-to-

face classes (Biner, Dean & Mellinger, 1994; Russell, 1999; Thomerson, 1995; Westbrook, 1999). Several studies (Diaz, 2000; Hansen et al., 1997) found that distance students actually perform better than traditional students as measured by learning outcome, but these studies mark a departure from the growing evidence to the former.

Probably the most significant study in this area is the North Carolina State University study (Russell, 1999). This long term literature review by Russell, commonly called “The No Significant Difference Phenomenon” has continued to find that while studies have ebbed and flowed on the power of one medium of deliver over another, there is no significant statistical difference or patterned benefit of one delivery method over the other between the two.

In his literature review for a study on student attitudes in graduate instruction via Web-based distance education, Westbrook (1999) concluded that “the most consistent finding in distance education literature was the similarity in academic performance between students enrolled in traditionally offered face-to-face classes and students enrolled via technology.” (p. 33) Biner et al. (1994), Hanson et al. (1997), and Thomerson (1995) echoed these findings. However, because of a lack of control of extraneous variables, lack of random assignment, use of instruments with unknown or questionable validity or reliability, and a general failure to control for reactive, short-term effects of the educational experience, Merisotis (1999) and Merisotis and Phipps (1999) strongly question the validity of such studies.

Offering one paradigm adjusting view has been Diaz (2000, 2002) who has argued that learning outcomes, specifically looking at drop rates in online courses, should not be viewed negatively as in the traditional sense. Diaz argues that high online drop rates (learning outcomes) do not necessarily indicate academic nonsuccess. Rather, Diaz

argues that high drop rates may indicate better strategic movements on the part of more advanced, older and more experienced online students as his research found to be the online student's demographic profile.

Student Attitudes, Satisfaction, Retention, and Attrition

In spite of an apparent lack of outcome differences between on-campus and online course students, evidence supports that students prefer the traditional classroom (Schlosser & Anderson, 1994). Savard et al. (1995) found in their literature review that there was rarely a significant difference in student attitudes toward learning and outcome between distance learning and traditional settings. However, in several studies they reviewed there were problems with attrition and retention in distance learning courses, which they sometimes attributed to a sense of isolation socially or intellectually.

Although not generalizable, there is anecdotal evidence to suggest that with the use of interactive assignments and the development of communities of practice in a course (Lave & Wenger, 1991; Liston, 1997; Palloff & Pratt, 1999; Powers & Mitchell, 1997; Tu & McIssac, 2002), the students begin to develop internal support systems that foster support and growth in each other's development. Tu and McIssac (2002) found that "social presence" positively influenced online interaction. Tu and McIssac defined their "social presence" as "the degree of feeling, perception, and reaction of being connected by CMC [computer mediated communications] to another intellectual entity through a texted-based encounter." This definition follows similar lines of research in communities of learners and practice by others (Lave & Wenger, 1991; Palloff & Pratt, 1999; Tu & McIssac, 2002). Maloney (1999) found that students in online courses reported that they were more likely to participate in online discussions than if they were in a more traditional setting.

From a different angle, Weigreif & Mercer (1996) suggested that for online students an important threshold existed that seemed to be directly related to student retention: producing community. Weigreif & Mercer (1996) in a case study of college students in an online course found that students who felt part of a community crossed a threshold from feeling like outsider to one feeling like an insider to a community group. Those that crossed this threshold into full participation in a collaborative learning environment showed increased satisfaction with learning online. While Weigreif focused on community of practice and learners as part of an asynchronous online environment, the findings support other research on the importance of community to the learning experience (Hanson et al., 1997; Lave & Wenger, 1991; Palloff & Pratt, 1999; Tu & McIssac, 2002).

In an attempt to improve the level of retention in distance education courses, and within these bounds of increased social presence, Savard et al.(1995) attempted to increase the level of interaction. They found several interesting elements. First, they found that female students worked harder on collaborative projects than they did on individual projects. Next, they found that students in distance education courses overall expressed more frustration and were less comfortable with group assignments than when working individually. Finally, they found students took longer to complete assignments when working with a peer than while working individually. Savard et al. concluded that their findings suggest distance education students are attracted to this form so as to order their schedules more freely, but that group assignments may contradict that benefit. Other studies have suggested that other factors may be at play in the retention and attrition of distance education courses.

Kerka (1996) determined that technical skills might play a larger role in online courses and attrition than in traditional classes. Kerka reported that students appeared to need to be able to comfortably navigate the Internet and course Web sites, as well as be comfortable coping with the computer difficulties that inevitably arise. Further, Kerka suggested that information management and information overload was a significant challenge for online students. The vast amount of online information the Internet provides through which students regularly wade with little prior training in validating source material, and the addition of the plethora of e-mail messages and newsgroup/discussion boards, posts to read and respond to, are overwhelming to the neophyte scholar. Mendels (1999) reported that students felt a sense of information overload from e-mail, and they believed that face-to-face interaction would be easier. Some students reported feeling isolated, missing the face-to-face communication in the online courses.

In his doctoral dissertation research and later in several articles examining student retention, Diaz (2000) found that online students tended to be older, generally have completed more college credit hours and more degree programs and have a higher all-college GPA prior to entering an online course than traditional college students entering a traditional setting course. Diaz argued that while “drop rate” has become somewhat synonymous with “academic nonsuccess”, this may be a misnomer in the online environment. In support he makes the supposition that older and more academically experienced would be more keenly aware of their GPA and the means to maximize that GPA, which would include dropping a course rather than being assigned a D or F score (a clear sign of academic nonsuccess). He went on to suppose that doing the “right thing to do” (Diaz 2002), they are exhibiting behavior consistent with mature, well-informed and

rational decision making and not behavior of impetuous youth and inexperience. In so far as this supposition does not necessarily support any one position, it does provide an alternative explanation that has not been examined in other research thus far regarding online student retention.

Personality Research and Computers

While not specifically focused on personality as is this study, temperament research especially that of Keirsey and Bates (1984) is linked to Jung's psychological types and the earlier work of Briggs. Temperament is the description of an individual's pattern of personality interaction with the environment to satisfy needs. Keirsey (1998) explained temperament as a configuration of inclinations, as compared to character, which is a configuration of habits. Unless acted upon by some extreme event, temperament is an inborn human trait to which people develop appropriate behaviors as they mature (Stokes, 2001).

Based upon Plato's types of human character, Keirsey and Bates (1984) developed the Keirsey Temperament Sorter (KTS/KTSII) as a self-assessment instrument to identify individual's temperament. Subsequently revised, the KTSII groups temperaments as artisan, guardian, idealist, and rational. These groupings match, respectively, the MBTI's: SP (Sensing/Perceiving), SJ (Sensing/Judging), NF (Intuition/Feeling), and NT (Intuition/Thinking).

There are relatively few studies at this point that specifically examine the personality temperaments and characteristics of students in online courses. MacGregor's (2000) work marks one of the first significant studies into this area. In her doctoral literature review, as she points out, that while there is little specifically connecting online

student personality types with success or retention there is a relevant body of literature for expecting personality differences in online students from traditional students.

First in this body of literature is research that looks at personality differences of people in various professions. Job recruiters have for years used personality testing in their placement of people into jobs based upon likelihood of proper job-to-personality fit. This research's focus will be on those people interested or successful in computer related professions compared to the general population.

The second research line involving personality types and connections with computers looks at the attitudes of students toward computers and has found direct relationships between personality and attitudes toward computers. Likewise, this study will draw a line from this earlier research to the particular needs of this personality study to demonstrate the connection.

The final literature review of this study will draw from other research that used the Myers-Briggs Typology Indicator and/or demographic information to examine student experiences in various forms of computer-based instruction. These studies have resulted in inconsistent findings that support the need for more research in this area. With the continued and growing popularity of distance education and specifically online instruction (National Center for Education Statistics, 2008), this research could help educators accommodate and place students into course modes that improve student success, student retention, and student learning in much the same way that job recruiters help place job seekers in good-fit positions.

Foundation of Personality Typing

The 16PF, the Myers-Brigg Type Indicator Test (MBTI) and, more importantly for this study, the Keirsey Temperament Sorter (KTS) and Keirsey Temperament Sorter

II (KTSII) loosely use Carl Jung's *Theory on Personality Types* as their basis. From this common foundation they extrapolate a slightly different perception of a combination of observable differences in mental functioning to produce 16 general "types" (or "temperaments" depending on the test) of preferences in the way people use their minds. Preferences here refer to the way people generally use their minds to perceive and understand items and events around them. Preferences also include the way people judge their perceptions and come to a conclusion about what has been perceived. Combined, perception and judgment make up a large portion of peoples' total mental activities (Briggs Myers, 1980). Further, perception and judgment govern a person's outward behavior since "perception—by definition—determines what people see in a situation, and their judgment determines what they decide to do about it" (Briggs Myers & Myers, 1980, p.1). Therefore, it is reasonable that differences in perception would result in differences in observable behavior that can be studied and categorized.

Perceiving: Sensing and Intuition

Jung and Baynes in their *Psychological Types* (1921) pointed out that there are two sharply contrasting ways in which people perceive the world around them. One of the means of perceiving the world is through the process of sensing. Through the familiar use of our five basic senses, people who prefer sensing are generally interested in the concrete, or actuality, around them and have little use or patience for ideas and abstracts.

The other sharply contrasting means of perceiving is through the process of intuition. Those who prefer this process indirectly perceive the world by way of unconsciously incorporating ideas or associations that the unconscious adds on to incoming perceptions of the outside world. Those people who prefer intuition generally look at the possibilities life presents and seldom look intently at the actualities.

Jung speculated that as soon as a child had enough of a command of his or her mental process, the child began to develop preference for perceiving the world in one of these two ways (Jung & Baynes, 1921). While both forms of perception will be in every person, the continued practice in the preferred method allows for the growth of a dominant trait. Thus, by a natural development of a sequence of events, the child who prefers sensing and the child who prefers intuition will develop along divergent lines with observable differences in their behavior. In the MBTI and the KTS/KTSII, this is the SN preference: S for sensing and N for Intuition.

Judging: Thinking and Feeling

Just as a basic difference arises in perceiving the world, sharply contrasting differences arise in how people judge these perceptions. One of the ways people come to judgments about the world around them is the use of thinking. By using a logical process to bestow an impersonal finding or judgment, people who prefer thinking look at the logical consistency of things they perceive and act accordingly.

The other means by which people arrive at conclusions about their experiences and the world is by feeling. Those who prefer feeling place a subjective value on the world they perceive. Rather than a logical process to arrive at a judgment on the world around them, they are conscious first of ideas, events or things being pleasing or displeasing, supporting or threatening, and react accordingly on that. As soon as a child has gained command of its mental processes, it will begin to develop both ways of judging. However, just as with the SN preferences, a child will develop a dominant way of judging the world. A child who prefers thinking as a means to make a judgment will develop behaviors along divergent lines from a child who prefers feeling, even when both

prefer the same perceiving process and begin with the same perceptions. This is the TF preference: T for thinking and F for feeling.

Combining Perception and Judgment

The SN preference (Sensing/Intuition) and the TF preference (Thinking/Feeling) are independent of each other. Thus either preference of perception can team up with either preference of judgment producing four combinations: ST, sensing plus thinking; SF, sensing plus feeling; NF, intuition plus feeling; and NT, intuition plus thinking. Each of these combinations produces a different kind of personality that are characterized by the interests, values, needs, habits of mind, and surface behaviors that naturally result from the combination (Briggs Myers & Myers, 1980; Keirsey & Bates, 1984).

Combinations with a common preference share some qualities, but each combination has qualities of its own that arise from the interaction of the preference traits. Whatever a person's combination of preferences may be, those with the same combination preferences tend to have similar interests, values, judgments, perception, and consider the same things important (Briggs Myers & Myers, 1980; Keirsey & Bates, 1984).

ST (sensing/thinking) preference people rely primarily on sensing for their perception and thinking for their judging. They tend to focus upon facts and arrive at their decision through impersonal analysis. Consequently, their personalities tend to be practical and matter-of-fact (Briggs Myers & Myers, 1980; Keirsey & Bates, 1984). The SF (sensing/feeling) preference people also rely primarily on sensing for their perception, but they prefer feeling for their judgment. Their personal warmth, sociability and friendliness weigh how much things matter and what decisions they will make. Consequently, their personalities tend to be warm and caring. They are more interested in

facts about people than in facts about things (Briggs Myers & Myers, 1980; Keirsey & Bates, 1984).

The NF (intuition/feeling) preference people also possess the personal warmth, sociality, and friendliness of SF preference people for judging, but because NF preference people prefer intuition to sensing they do not center their attention upon concrete situations. Instead, they are characteristically idea people who focus on what is possible. Their warmth and gift for language make them insightful and persuasive. These factors require human interaction for them to be most comfortable (Briggs Myers & Myers, 1980; Keirsey & Bates, 1984).

The NT (intuition/thinking) preference people rely primarily upon intuition also as their means of perceiving the world. Though they also focus upon possibility, their thinking preference for judging the world makes them more comfortable with impersonal analysis (Briggs Myers & Myers, 1980; Keirsey & Bates, 1984).

The Extraversion-Introversion Preference

Jung and Baynes (1921) saw another basic difference in how people use their perception and judgment that arises from their relative interest in their inner and outer worlds. From this Jung formulated two terms that are both opposing yet complimentary orientations to life, Extroversion and Introversion. As with previous preferences, most people have some degree of both the extroversion and introversion preferences in them, but one is a dominant preference while the other is subservient.

People who prefer introversion tend to be more interested in the inner world of concepts and ideas, while those who prefer extroversion are more involved with the world of people and things (Briggs Myers & Myers, 1980; Keirsey & Bates, 1984).

People who prefer extraversion tend to be social, while those who prefer introversion tend to be territorial and desiring of private space both physically and mentally.

While neither preference necessarily enjoys complete interaction with or separation from others, people who prefer extraversion tend to gain strength from groups, while the opposite tends to be the case for people who prefer introversion. In a scholastic setting, extraversion manifests itself in discussion serving as part of the decision-making process, while for people preferring introversion discussion is done after an internal processing is done and a conclusion is reached (Briggs Myers & Myers, 1980; Keirsey & Bates, 1984).

The Judgment-Perception Preference

The final preference type that Jung and Baynes (1921), Briggs Myers and Myers (1980) and Keirsey and Bates (1984) use as a means of looking at how people deal with the world is the Judgment-Perception preference. While everyone uses both judgment and perception in dealing with life, it is impossible to use both simultaneously. The result is people tend to shift from judgment to perception and vice versa suddenly and frequently. However, most people find one of these methods more comfortable in dealing with the world and thus use it more often than the other (Briggs Myers & Myers, 1980).

These two preferences are in opposition fundamentally. People who prefer perception shut down all judgment and conclusive decision-making, continually adding more information, and seeking new developments to a situation. This may cause perception preference people to appear indecisive to others. People who prefer judgment turn off their perception, draw a quick decision based upon available evidence, and conclude all further evidence is irrelevant and immaterial. These two preferences produce

observable differences between judgment preference people, who order their lives, and perception preference people, who simply live their lives (Briggs Myers & Myers, 1980).

The Dominant and Auxiliary Processes

With each of the preference processes except Judgment-Perception, which interplay with each other on a continuously changing basis, people demonstrate an observable preferred way of perceiving and ordering their world. Their preferred processes serve as governing forces in their make-up and by adulthood they are generally well developed to where it dominates their values, perspectives, perceptions, judgments and actions (Briggs Myers & Myers, 1980; Kroeger & Thuesen, 1988). For example, ENF's naturally gives their intuition (N) the right of way over sensing (S) in their judgment of the world. Only when their sensing does not conflict with their intuition preference do they naturally allow their sensing to influence their actions. Even then, because their preference is to intuition and is thus better developed, they will only use their under-developed sensing to the degree to which it is developed. Jung empirically noted and reported this use of a dominant process that is characterized by the letter score assigned through the MBTI or Keirsey Temperament Sorter.

Jung held that dominant processes must exist, and that individuals cannot use all processes equally where neither is better developed nor under-developed because opposite processes existing equally within the same individual keep both processes under-developed. Jung referred to this situation as "primitive mentality" arguing both processes would interfere with each other if both were equally developed. From one process to be more developed, this development would necessitate the individual giving undivided attention to the process and less to the other thus bringing about a dominant. While two processes can co-exist in one individual, and generally do, one must have clear

sovereignty and dominance over the other (Briggs Myers & Myers, 1980; Kroeger & Thuesen, 1988).

Jung did not explore the role of an auxiliary process in his work, Briggs Myers and Myers (1980) went on to argue that one process alone is not enough. For balance in a person's perception and judgment the dominant process must have a needed auxiliary process, a "loyal lieutenant" (Briggs Myers & Myers, 1980). For example, if the dominant process is perceptive, the auxiliary process will be judging. Excessive dominant processes or no auxiliary process at all becomes obvious as the person's actions lack direction, form or content.

Since Jung never described or formulated a balance between dominant and auxiliary processes, other researchers (Briggs Myers & Myers, 1980; Keirsey & Bates, 1984) have added this description to Jung's theory and built upon it. Briggs Myers and Myers (1980) argued that Jung's focus upon "pure" types in shaping Introversion-Extraversion processes excludes the reality of the existence of an auxiliary process. The E/I process directly influences the dominant process manifestations and exhibited behaviors. Pure introversion types, as Jung described, would result in an abnormal balance within the individual that would produce negative behavior and visa versa for extraverts. Briggs Myers and Myers (1980) asserted that the existence and workings of auxiliary process's effect on introversion and extraversion are confirmed by observation.

Personality Types and Computers

A popular area for personality typology research attempts to describe patterns of personality in professions and work related areas. Career counselors frequently use the results of this research to help direct clients into jobs and professions that are suitable to their personality profiles. From this research we may glean that in a way similar to certain

professions attracting and retaining particular personality types, online courses may attract and retain particular students.

While the MBTI, the Keirsey Temperament Sorter and the 16PF are the most frequently seen tests for personality research and the ones on which this research focuses primarily, one additional personality test that has shown up in studies is the Eysenck Personality Questionnaire, or EPQ, used by Francis, Katz, and Evans (1996) and needs mentioning.

The EPQ examines only three dimensions of personality: neuroticism, extraversion, and psychoticism. According to Winter (1996), the neuroticism dimension refers to an individual's expression of mood swings, nervousness or general satisfaction or dissatisfaction. The extraversion scale is similar to other personality testing instruments with extraverts being physically active and sociable (Winter, 1996). The psychoticism dimension refers to someone who is impulsive, autonomous and risk-taking (Winter, 1996). This dimension is somewhat less well defined. While this research will not use the EPQ, its use in other research that this study will examine warrants mention of it here.

Personality Types and the Computer Professions

In an extensive review of the literature on computer science aptitude and professionals, Pocius (1991) concluded that while several different MBTI types of individuals could do well in computer programming classes, the type mix of those going into the profession was significantly different from the general population. Computer programmers and computer science majors contained significantly higher percentages of people classified as introverted (I), intuitive (N), and thinking (T) than the general

population. Based upon existing research, he further speculated that people with an internal locus of control might be drawn to computer-related activities.

Pocius (1991) found that the most widely studied personality factor in human-computer interaction literature is the Introversion-Extroversion factor. Various studies on the subject found that an introverted personality types positively related to computer aptitude and achievement. The computer science major population studied has a much higher percentage of introverts (63%) than the general population (25%). The largest MBTI personality types in the studies were ISTJ and INTJ, both introverted types.

In a literature review of two studies using the 16PF, Pope (1988) likewise concluded that computer programmers were significantly different than the general population. While Pope used the more popular MBTI in his own study, he concluded that his results indicated computer programmers were more likely to be introverted (I), intuitive (N), thinking (T) and perceiving (P). Computer technicians however tended to be extraverted (E), thinking (T) and judging (J). Pope speculated that the technician's job took them into the interactive world of the work place thus making extroversion an asset for them, whereas the noninteractive nature of programmers allowed introverts to thrive.

In a final study reviewed, Bulleit (1993) used the MBTI to identify different personality types between mainframe-oriented and microcomputer-oriented computer professionals. Bulleit's study revealed that over 80% of the study respondents were thinkers (T) as compared to 50% in the general population. Further, 66% of the respondents reported a judging (J) preference. Of the 16 possible personality types, ISTJ, INTP and INTJ represented over half the survey population. The results of these studies support the rationale that specific type factors in people are more prevalent in computer-based environments than in the general population.

Personality Types and Computer Attitudes

Several studies have sought a relationship between personality types and attitudes toward computers. Like most other studies on computer-oriented personality types, these typically used the MBTI (Anderson, 1987; Garrett-Bullock, 1997; Whitley, 1996). However, Francis et al. (1996) deviated from this pattern and used the Eysenck Personality Questionnaire (EPQ). Using the three-dimension EPQ in their study of females in Israel, Francis et al. (1996) found those scoring higher on the psychoticism scale and lower on the extraversion scale reported a more positive attitude toward computers. Francis et al.'s findings support the findings of other studies in a relationship existing between those with an introversion (I) preference and positive computer attitudes.

Two studies (Anderson, 1987; Garrett-Bullock, 1997) found no relationship between personality types and computer anxiety. Anderson (1987) attempted to find a possible relationship using the MBTI but failed to find any significant relationship between personality types and attitudes towards computers. However, Anderson did find that males tended to have a more positive attitude toward computers than females. In a study of post-50 adults, Garrett-Bullock (1997) likewise found no significant relationship between personality type and computer anxiety. As with Anderson's study, Garrett-Bullock used the MBTI and a computer anxiety questionnaire. While there was no statistically significant relationship found between computer anxiety and personality type, Garrett-Bullock likewise found that males tended to have a more positive attitude toward computers than females, thus supporting Anderson's (1987) findings from ten years earlier.

From the perspective of personality types, specifically using the MBTI, and computer anxiety, Whitley (1996) found that Intuiting (N) personality types had a higher computer aptitude than Sensing (S) types and Thinking (T) personality types reported slightly less anxiety than Feeling (F) types. Whitley reported however that on this last point Feeling (F) types tend to have greater anxiety overall in a wide variety of experiences than Thinking (T) types. This may mitigate that point of the study.

From Whitley's (1996) findings on gender, women with a Thinking (T) preference reported spending more time on the computer each week than women with a Feeling (F) preference. Also, women with an Introverted and Intuitive (IN) preference tended to spend more recreational time on the computer each week than did other women. Whitley suggested that future research focus on gender as an important variable for consideration.

A significant contribution to educators' understanding of online students was Westbrook's study. Westbrook (1999) looked at student attitudes about web-based or online delivery of instruction and the student's perceived level of learning in graduate instruction. Westbrook found that students believed they learned the same amount in the Web-based class as they did in a traditional classroom setting. Students did perceive the Web-based course as more time consuming than a traditional class. And students experienced significant increases in the anticipated to actual student-to-instructor and student-to-student interactions online (this is the amount of time students anticipated they would spend interacting with other students and with the instructor, and how much time they actually did spend engaged with each other during the course). Westbrook did not offer either positive or negative conclusions or positive or negative student attitudes to the web-based, online experience overall.

Taken together these studies provide support to the rationale that particular personality types will have a more positive attitude toward computers and may be more likely to participate and succeed in an online course. The findings of these studies also indicate that the students who will participate and succeed in an online course may more likely be Introverted (I), Intuitive (N), and Thinking (T), or INT in their MBTI profiles.

Personality Types, Gender, Demographics, and Computer Instruction

A number of studies have examined student experiences and characteristics in a variety of computer-mediated or computer enhanced courses including online courses (Richards, 1992 and 1995; Westbrook, 1999), computer-mediated communication (CMC) courses (Blocher, 1997), and computer-assisted instruction (CAI; Ayersmann & von Minden, 1995; Broughton, 1986; Howard, 1986; Meunier, 1996; Pocius, 1991; Suddendorf, 1986). These studies looked at several student characteristics including personality (Broughton, 1986; Ellis, 2003; Howard, 1986; MacGregor, 2000, 2002; Meunier, 1996; Pocius, 1991; Stokes, 2001; Suddendorf, 1986), learning styles (Ayersmann & von Minden, 1995), student attitudes (Pocius, 1991; Westbrook, 1999), gender (Blocher, 1997), and demographic characteristics (Richards, 1992, 1995). While some of these studies provide positive information for researchers in understanding students in online learning (Blocher, 1997; Westbrook, 1999), most findings provided little information or inconsistent and sometimes insignificant results thus beckoning more research be done.

One of these studies that has contributed to educator's understandings of online students was Blocher's doctoral dissertation study. Blocher (1997) looked for differences in the use of computer-mediated communication (CMC) courses in blended classroom formats based on gender. He found that gender played a role in the use and levels of

engagement in CMC. Women displayed less engagement in CMC and described it as less personal than face-to-face communication. Women were more often very offended by critical remarks posted to CMC systems (either e-mail or listservs). Women reported valuing e-mails to individuals over the less personal listserv. Women did not value trivial messaging or anonymous communications as much as men did. Trivial communications on the listserv tended to bother men less than women. Both genders displayed a high negative correlation between task anxiety and total CMC engagement. But both genders did report a greater feeling of involvement in the course through the use of e-mail and the listserv. This study supports the assumption of the importance of gender as a factor in computer-based courses, and seems to indicate a more personal and purposeful approach based upon gender. In the study, Blocher did not examine personality. Still, the study's demographic findings do lend themselves to supporting predisposed characteristics for successful online students existing.

Richards (1992, 1995) compared demographic characteristics of students in "computer-modem" classes to students in traditional classrooms. Today's writers would refer to Richards' 1995 "computer-modem" class as an "online" course. Richards found that computer-modem students tended to be part-time students, female, older, and employed full time. While interesting, these findings are inadequate as they match the description of the typical nontraditional, adult student, and do not elaborate on the characteristics to provide much new information. Studies such as this that seek to compare online students to traditional face-to-face classroom students do little to inform researchers about online students' characteristics or their motivations for selecting this method of instruction.

Pocius (1991) reviewed research on computer-assisted instruction (CAI), but found mixed results. CAI courses are defined as a noninterpersonal context (Pocius, 1991). Students typically work in an individual, self-pacing environment where there is little social, cognitive or emotional support from, or exchange with, other individuals. Pocius concluded that the findings from research on personality characteristics and CAI suggest that students with introverted (I) qualities perform better than extraverted (E) individuals unless a social or interpersonal/interactive component is added to the CAI course, wherein extraverted (E) types may do better than introverts. (I)

One study Pocius reviewed that used the MBTI for characterizing students concluded that Thinkers (T) had a more positive attitude toward CAI than Feelers (F). Still another study from Pocius' research concluded that Sensing (S) people have more positive attitudes toward CAI than Intuitive (N) people, and yet a third study found no relationship between attitude and MBTI types (Pocius, 1991). While these inconsistent findings may be the result of small sample sizes, poor methodology or weaknesses in the reliability of the MBTI, Pocius' review does not support or lend rationale to students who elect to take or succeed in online courses being different than those in traditional courses or those who do not. Yet his finding of inconsistent results does lend further credibility to the need for more research.

While somewhat dated by technology, hindered by narrowness, and inconsistent with other studies, Suddendorf's (1986) doctoral dissertation using MBTI and CAI with students in a medical technology program found that extraverted (E), sensing (S), feeling (F) and judging (J) types showed a more positive attitude and propensity toward the CAI format than other groups. However in her literature review, MacGregor (2000) asserted

that Suddendorf's narrow group of participating students may be at the heart of these contradictory findings.

Howard's (1986) study of the attitude on learning in CAI environments and their relationship to personality found no significant difference between personality types and attitudes toward CAI learning. Howard's simple classification was not related to learning outcome or retention, and the study's statistical analysis and research design leaves some question on the study's validity (Pocius, 1991).

Meunier's (1996) study comparing MBTI scores of students in a CAI foreign language course also used a narrow range of students. Meunier found that no significant difference existed in the overall learning of males and females. On certain tasks males did perform better than females, but this did not affect the overall learning. Meunier further found that Intuitive/Feeling (NF), and Intuitive/Thinking (NT) types learned significantly more in the CAI environment the Sensing/Feeling (SF) or Sensing/Thinking(ST) types. However, Meunier's focused use of NF, NT, SF, and ST personality categorizations makes comparison of these results to other studies difficult. Still, his findings lend further credibility to the rationale of a potential difference between successful online students and the general population.

From an interesting design twist, Broughton (1986) used MBTI as a predictor of success in a study comparing CAI with the traditional classroom. Broughton found no significant differences in test scores between students in CAI and students in traditional format classes. Extroverts (E) did report a preference for the traditional lecture format over the computer format. This result is consistent with other studies using the Introversion-Extroversion personality dimension.

Ayersman and von Minden (1995) reviewed literature on individual differences, computers and instruction. Ayersman and von Minden reported a variety of different ways students in traditional settings experience learning but found little on similar experiences for online students. Examining the literature on individual differences from Witkin's Field Dependence/Independence research (1973), through various learning and cognition styles and personality types, Ayersman and von Minden found a marked absence of such research on students in computer-mediated instruction. Taking into account all of the different student characteristics that affect learning outcomes, Ayersman and von Minden recommended more research in these various characteristics on students in online and virtual classrooms.

In both her 2000 doctoral dissertation and her follow-on article (2002), MacGregor attempted to find personality differences between online and face-to-face students. Using the 16PF, MacGregor (2002) found "clear differences... on the Extraversion, Independence, and Self-Control factors" (p. 19). She reported, "the only global factor on which online and face-to-face groups did not differ notably was Anxiety, for which both groups had an average score"(MacGregor, 2002, p. 19). She made a startling conclusion saying,

The online students who successfully completed their courses were more apprehensive, less lively, less socially bold, and less open to change than students in face-to-face classrooms. They were also more worrisome, serious, shy, and accepting of the status quo. In addition, the online students in this study were less extraverted, less independent, and higher in self-control than the face-to-face classroom participants. (MacGregor, 2002, p. 21)

Ellis (2003) attempted to find relationships between personality types and participation in networked learning environments using asynchronous threaded discussions. Ellis looked at participation in a hybrid (mix of face-to-face and online

work) university course. The subjects were ethnically and culturally diverse and included Swedes, Australians, Asians, Southeast Asians, Europeans and Middle Easterners divided into two cohorts, one in Australia and one in Sweden. Using the MBTI, Ellis found that on the four dimension scales, introversion, intuition, thinking, and judging subjects interacted to a greater extent online than other dimensions. Ellis concluded “there is a marked difference in attitude between introverts and extraverts. . . . Those with introverted thinking appear more willing to contribute than extroverted thinkers” (p. 113).

Personality Types and Student Grades

Biner et al. (1995) compared students in telecourses and traditional courses. The focus of the study was to determine if there were personality differences between telecourse students and traditional students. A second focus of the study was an attempt to determine if specific personality traits would predict student performance in the telecourses. While the Biner et al. (1995) study examined telecourses and used the 16PF which this study does not, its findings support assumptions on the presence of personality differences and student performance.

The Biner et al. (1995) study looked at eighteen undergraduate and graduate courses in a large midwestern university during the 1993-1994 academic year. Of the 178 telecourse students and 271 traditional course students enrolled in the courses and serving as potential subjects, 164 telecourse students and 200 traditional students agreed to participate. Biner et al. (1995) found some interesting differences between the two groups.

The Biner et al. (1995) study found telecourse students scored significantly higher on four of the 16 factors. Telecourse students were more abstract thinkers (B+), emotionally stable (C+), trusting (L-), and controlled (Q3+). The study found that the

interaction effect was mostly in the dependence and control factors with telecourse students showing higher in dependent and conforming as compared to traditional students. An important finding that came out of the study was the difference in age with telecourse students having an average age of 36.16 and the traditional students having an average age of 22.37. However, the study found that age had no effect on the results in anyway.

Having used the Zero-Order Correlations using the 16PF scores and the final course grades, the Biner et al (1995) study found correlations between final grades and each group. Among traditional students, higher grades were associated with being emotionally stable (C+), serious/sober (F-), shy (H-), imaginative (M+), and experimenting/liberal (Q1+). By contrast, telecourse students had higher grades associated with being more self-sufficient (Q2+) and undisciplined/noncompulsive (Q3-). Additionally, telecourse students had higher grades related to a higher level of expedience (G-), also referred to as self-indulgent and disregarding the rules, while traditional students showed an opposite relationship with higher grades relating to higher levels of conscientiousness (G+), also referred to as persistent, moralistic, and rule-bound. These results support the premise that different types of people thrive in different types of academic environments.

In second order factors, Biner et al. (1995) found that introverts did better in both telecourse and traditional formats. Higher grades for telecourse students were associated with low control, also referred to as nonconforming, impulsive and rule-bending. For traditional students, higher grades were associated with low anxiety, greater emotional stability, and higher control, also referred to as acting on values of sense of duty, and conforming to social expectations.

Biner et al. (1995) concluded that successful telecourse students tend to be “resourceful and prefer to make their own decisions” (p. 57). Additionally, “they are not overly concerned about following social rules or conventions, and may actually disregard them altogether in some circumstances” (p. 57). These students are also “introverted, self-indulgent... and tend to meet their responsibilities in an efficient, expedient manner” (p. 57).

Personality Research Tool Compatibilities

This study will use the KTSII for testing. The more widely known, used, and shorter length KTSII will provide greater potential for seamless applicability to existing student services and admissions offices in a college or university environment. However, due to the use of the 16PF and MBTI in other studies related to this study and online student personality traits, some mention of the correlations between these tests is necessary.

16PF test. Because some of the research thus far in the area of personality traits and computers have used the 16PF, and because there is some alignment between the 16PF, the MBTI and the KTSII, it is important to discuss each, and understand its alignment to the MBTI and KTSII.

The 16PF is a highly regarded and highly recommended personality inventory (Riveria, 1996). Likewise, it ranks high as one of the most frequently referenced personality tools in research articles (Schuerger, 1992). Rather than assess pathology as other personality tools do, the 16PF assesses normal personality styles (Schuerger, 1992).

The 16PF currently consists of 185 multiple choice items that generate a Standard-ten (STEN) score along sixteen personality trait lines. These sixteen lines are Warmth, Reasoning, Emotional Stability, Dominance, Liveliness, Rule Consciousness,

Social Boldness, Vigilance, Abstractness, Privatness, Apprehension, Openness to Change, Self-Reliance, Perfectionism, and Tension (Aiken, 1997b). The STEN scores generated for each trait are based upon a ten-point scale and generate a standard deviation of 2 (Rivera, 1996). Scores further generate a second set of second-order factors for each person, namely, Extraversion, Anxiety, Tough mindedness, Independence, and Self-control. According to Riveria (1996), these secondary factors were previously known as Extraversion, Adjustment, Tough-mindedness, Independence, and Discipline. Scores and reliability for the 16PF are reported as fair (Aiken, 1997b) with second-order factors having the highest reliability.

Like the MBTI, the 16PF assigns a letter to each factor. These letter codes are A (warmth), B (reasoning), C (emotional stability), E (dominance), F (liveliness), G (rule consciousness), H (social boldness), I (sensitivity), L (vigilance), M (abstractness), N (privateness), O (apprehension), Q1 (openness to change), Q2 (self-reliance), Q3 (perfectionism), and Q4 (tension). Additionally a “plus” or a “minus” on a factor code is used to indicate a high score and a low score respectively for each factor with the code.

As mentioned earlier, the 16PF is based on a trait theory of personality. Released in its first edition in 1949 (Schueger, 1992), the sixteen personality traits are the end results of the reduction of a list of 17,953 words in the English language on personality characteristics to their commonality. This list of traits was used to generate statements and questions to assess the degree to which persons reported having each trait (Aiken, 1997a). Factor-analysis, a method only Cattell has used in developing a personality inventory (Schueger, 1992), was used to refine the results of the 16PF. This factor-analysis is intended to develop consistent sets of highly inter-correlated items. The items that make up each scale within the test have low correlations with other scales in the

inventory, thus determining the minimum number of factors needed to account for most of the variability among scores on the scales. This has resulted in a test that is internally consistent and has independent measures of various traits (Aiken, 1997b).

Correlations between the MBTI, the 16PF, and the KTSII. While the present study looks at the relationship between student retention and success in online classes and student personality types, and although there are higher level personality testing instruments, namely the 16PF, the decision to use the KTSII in this study is based upon the correlations of results between the KTSII, the MBTI and the 16PF, the proctoring requirements of the MBTI and the 16PF, and the shorter testing time of the KTSII that makes it more amicable to use in college and university admission offices. Understanding the correlations between these testing instruments is therefore necessary to compare results with other studies.

The KTSII

While conducting his own work in temperament and personality, David Keirsey would both be inspired by the work of Isabel Meyers and Kathryn Briggs and differ in opinion from it. Historically, Keirsey identified four temperament patterns. While named differently by various authors through the ages, each of the four archetypes is descriptively similar and comparable. Table 1 shows the history of temperament patterns over time.

In their book, *Please Understand Me*, Keirsey and Bates (1984) described four general temperament types as Dionysian, Epimethean, Apollonian, and Promethean. In his second book *Please Understand Me II*, Keirsey (1998) would rename these four archetype temperaments to Artisan (SP), Guardian (SJ), Idealist (NF), and Rational (NT).

Table 1

Keirsey's the History of Four Temperament Patterns Through the Ages

The History of Four Temperament Patterns Through the Ages				
Ezekiel, c.590 BC	Lion	Ox	Man	Eagle
Hippocrates, c.370 BC	Cheerful	Somber	Enthusiastic	Calm
Plato, c.340 BC	Iconic	Pistic	Noetic	Dianoetic
Aristotle, c. 325 BC	Hedone	Proprietari	Ethikos	Dialogike
Irenaeus, 185 AD	Spontaneous	Historical	Spiritual	Scholarly
Galen, c. 190 AD	Sanguine	Melancholic	Choleric	Phlegmatic
Paracelsus, c. 1550	Salamandar	Gnome	Nymph	Sylph
Adickes 1905	Innovative	Traditional	Doctrinaire	Skeptical
Spranger 1914	Aesthetic	Economic	Religious	Theoretic
Kertshmer 1920	Hypomanic	Depressive	Hyperesthetic	Anesthetic
Fromm 1947	Exploitative	Hoarding	Receptive	Marketing
Myers-Briggs 1958	Perceiving	Judging	Feeling	Thinking
Keirsey 1978	Dionysian	Epimethean	Apollonian	Promethean
Keirsey 1998	Artisan (SP)	Guardian (SJ)	Idealist (NF)	Rational (NT)

Keirsey argued that a person's personality could be observed by what a person did and what that person said. Communicatively, people show a tendency to prefer expressing concretely (faces and figures, a focus on the everyday world and what is real) or abstractly (theories and conjectures, beliefs and possibilities, a focus on the world of ideas). In action and deed, people show a tendency for either cooperation (acting in a socially conscious manner, *doing the right thing*) or utilitarian (pragmatic, *do what gets results*). For Keirsey, the union of these two axes establishes a matrix within which all people will fall.

Table 2

Keirsey's Archetypes

		Communication	
		Concrete: Talk About Reality	Abstract: Talk about Ideas
Cooperative: Do What's Right		Guardian (SJ) Talk About Reality Do What's Right	Idealists (NF) Talk about Ideas Do What's Right
ACTION			
Utilitarian: Do What Works		Artisan (SP) Talk about Reality Do What Works	Rational (NT) Talk about Ideas Do What Works

The KTSII uses the same eight descriptive letter results as the MBTI. Keirsey found that for four archetype temperaments, four particular trait types correlated strongly. N (iNtuitive) types correlated strongly with F (Feeling) and T (Thinking). S (Sensing) types strongly correlated with J (Judging) and P (Perceiving). These correlations yielded similarities and congruencies with four major temperaments that resulted in his classifications.

While Keirsey identified four temperament archetypes, within each type are four sub-types or individual types. In all, Keirsey identifies 16 separate temperament types that align with those identified by the MBTI. For each of the type characteristics the KTSII results and characteristics represent a strong match between the KTSII and the MBTI. According to Tucker and Gillespie (1993), the standard KTSII correlates to the MBTI as E/I = .76, S/N = .84, T/F = .73, and J/P = .73. Correlations between the KTSII computer version and the MBTI were higher at E/I = .85, S/N = .83, T/F = .86, and J/P = .84. Studies using the MBTI are directly translatable to the KTSII. Subsequently,

correlations between the MBTI and the other testing instruments apply also to the KTSII. With the popularity of the MBTI, more studies are available using it than the KTSII.

The 16PF and MBTI/KTSII E/I Factor

In a study of the relationship between grade point average and student's personality, Pollard (1988) included a discussion on the correlations between the MBTI/KTSII and the 16PF factors. The MBTI/KTSII's Extroversion/Introversion scores correlated with the 16PF's A, E, F, H, and Q2 factors. The 16PF uses these factors to generate the second-order score in extroversion. The Q2 factor inversely correlates to extroversion and thus can be used in conjunction with the MBTI/KTSII's Introversion/Extroversion (I/E) scale. These 16PF factors briefly are warmth (A+), Assertiveness (E+), Impulsiveness (F+), Boldness (H+), and Group Dependency (Q2-). In Rivera's study (1996), the 16PF's global factor correlated positively with the MBTI/KTSII's Extraversion (E) and negatively with the MBTI/KTSII's Introversion (I). In the 16PF administrator's manual (Russell & Karol, 1994), the MBTI/KTSII's Extraversion (E) and Introversion (I) was found to correlate with stable vs. reactive (Factor C) and private vs. forthright (Factor N) on the 16PF. Based upon these alone, the findings in research using the 16PF can be correlated in the E/I factor of the MBTI/KTSII.

The 16PF and MBTI/KTSII S/N Factor

According to Pollard's (1988) study, Sensing/Intuiting (S/N) scores on the MBTI/KTSII showed a significant correlation with imagination (Factor M) on the 16PF. Pollard demonstrated that high scores on Sensing (S) correlated with low scores on imagination (M) indicating a relationship between the 16PF's imagination (M) and the MBTI/KTSII's Intuition (N). Russell and Karol (1994) argued that the MBTI/KTSII's

Intuiting also correlated with abstract thinking (B+), sensitivity (I+), openness to change (Q1+), and flexibility (Q3-). Further, they found that the MBTI/KTSII's sensing correlated with the 16PF's practical (M-), traditional (Q1-), and perfectionistic (Q3+).

The 16PF and MBTI/KTSII T/F Factor

Pollard (1988) further indicated that the MBTI/KTSII's Thinking/Feeling (T/F) factor correlated significantly with the 16PF's utilitarian vs. sensitive (Factor I). A sensitive (I+) score on the 16PF correlated with a Feeling (F) score on the MBTI/KTSII. Further, the 16PF's utilitarian (I-) person is similar to the MBTI/KTSII's Thinker (T). Russell and Karol (1994) agree that the MBTI/KTSII's Feeling (F) correlated with the 16PF's sensitive (I+), but they showed little correlation between the MBTI/KTSII's Thinking (T) and the 16PF's utilitarian. However, they reported that the MBTI/KTSII's Thinking (T) also correlated with the 16PF's reserved (A-), private (N+), and unworried (O-) and that Feeling (F) scores correlated with warm (A+), sensitive (I+), forthright (N-), and worried (O+).

The 16PF and MBTI/KTSIIJ/P Factor

In the Pollard (1988) study, the MBTI/KTSII's Judging (J) personality type correlated significantly with the 16PF's Factor G (dutiful/conscientious) and Factor Q3+ (perfectionistic/controlled). According to the 16PF administrator's manual (Russell & Karol, 1994), Judging (J) correlated with practical (M-) and traditional (Q1-), while the MBTI/KTSII's perceiving correlated with nonconforming (G-), imaginative (M+), and flexible (Q3-).

Summary of Literature Findings and Possible Relationship to Current Study

The literature reviewed in this study generates potential predictability for the relationship between personality type and student success and retention in online courses.

Using research on personality characteristics of people in computer-related fields (Bulleit; 1993; Pocius, 1991; Pope, 1988), the research on student attitudes towards computers (Anderson, 1987; Biner et al., 1994; Francis, et al., 1996; Garrett-Bullock, 1997; Hanson et al., 1997; Thomerson, 1995; Westbrook, 1999; Whitley, 1996), the research on personality types and participation in networked learning environments (Ellis, 2003) and personality differences between online and face-to-face students (MacGregor, 2000, 2002), it is increasingly possible to predict that students who take classes via their computers will exhibit personality trait differences from students in traditional classrooms. Further research supports this characteristic difference between online and traditional students (Ayersman & von Minden, 1995; Blocher, 1997; Broughton, 1986; Ellis, 2003; Howard, 1986; MacGregor, 2000, 2002; Meunier, 1996; Pocius, 1991; Richards, 1992, 1995; Stokes, 2001; Suddendorf, 1986). It is increasingly possible to also predict differences in the Introvert/Extrovert, Sensing/Intuiting, and Thinking/Feeling factors of personality types between online and traditional students (Ayersman & von Minden, 1995; Blocher, 1997; Broughton, 1986; Ellis, 2003; Howard, 1986; MacGregor, 2000, 2002; Meunier, 1996; Pocius, 1991; Richards, 1992, 1995; Stokes, 2001; Suddendorf, 1986). Further, some research supports the potential to predict a relationship between personality traits and student grades (Biner et al., 1995).

Accounting for all of the literature reviewed for this study, successful and retained online students are more than likely to be older than traditional students (Biner et al., 1995; Richards, 1992, 1995; Thompson, 1998), female, work full time, and married (Richards, 1992, 1995; Thompson, 1998). And the student will have life factors that warrant them taking an online course over a traditional course such as, but not limited to, geographic remoteness (Richards, 1992, 1995; Thompson, 1998).

The successful and retained online student is more likely than traditional students to be introverted (Biner et al., 1995; Bulleit, 1993; Ellis, 2003; Francis et al., 1996; MacGregor, 2000, 2002; Pocius, 1991; Pope, 1988), thinking (Bulleit, 1993; Ellis, 2003; MacGregor, 2000, 2002; Pocius, 1991; Pope, 1988; Whitley, 1996), intuitive (Ellis, 2003; MacGregor, 2000, 2002; Pope, 1988; Whitley, 1996) and judging (Bulleit, 1993; Ellis, 2003; MacGregor, 2000, 2002; Pope, 1988;). They are also more likely to be abstract thinkers, trusting, emotionally stable, and controlled (Biner et al., 1995). However, personality traits of successful and retained online students are not a predictor of student satisfaction with online courses (Stokes, 2001) or computer anxiety (Anderson, 1987; Garrett-Bullock, 1997).

The successful and retained online student is also more likely than traditional students to participate in online discussions than in classroom discussions (Maloney, 1999), feel a sense of community in the online format (Weigreif & Mercer, 1996), feel less comfortable with group projects (Savard et al., 1995), have order in their schedules (Savard et al., 1995), and be more technically savvy (Kerka, 1996).

From these results, we have a caricature of the online student who will more than likely be more successful than others and who has the highest potential to return to online course after course. Identifying these students early would assist both the student and the university in planning and reaching the educational goals of both. For universities bound by the moral obligation of assisting students in reaching their academic goals—measurable in part by the university's success and retention rates—and economic necessity of retaining students, knowing who that potential audience is and identifying them early is of great assistance.

Chapter 3: Research Design and Methods

In spite of the lack of a national level tracking of online success and retention within U.S. colleges and universities, field studies indicate that retention of online students runs at about 16% points below traditional face-to-face classes (Crabtree, 2000; Cutler, 2000; MCC, 2001; Morrow, 2001; Valdez, 2001). And since currently there are no models to assist colleges in retaining online students, the need to understand what factors are common to successful, persistent online students becomes apparent. This study will examine personality type as a variable in successful, persistent online students to determine if this variable has significance in online student success and retention. At least four previous studies (Biner et al., 1995; Ellis, 2003; MacGregor, 2002; Stokes, 2001) have already begun to look at personality as a factor in several areas of online student experiences.

Previous Findings

Ellis (2003) investigated the relationship between personality type and a student's participation in an online threaded discussion board in a university hybrid course. Ellis (2003) found that patterns in student attitudes related to personality type did exist, particularly on the introversion/extroversion, sensing/intuitive and thinking/feeling dimensions. Introverted, sensing and thinking types showed a higher positive attitude and greater participation in an online environment. MacGregor (2002) found online students to be more introverted, accommodating and self-controlling than those in face-to-face classes. Biner et al.'s (1995) study differs a bit from Ellis' and MacGregor's studies in that it compared students in telecourses with traditional students. Like MacGregor's (2002) study, Biner et al. (1995) used the 16PF, but Biner et al. (1995) looked at both undergraduate and graduate students enrolled in eighteen courses at a large Midwestern

university during the 1993-1994 academic year. Biner et al. (1995) concluded that successful telecourse students tended to be “resourceful and prefer[ed] to make their own decisions...they are not overly concerned about following social rules or conventions, and they may actually disregard them altogether in some circumstances” and “introverted, self-indulgent... and tend to meet their responsibilities in an efficient, expedient manner, that is, without being overly compulsive about completing tasks” (p.57).

Stokes (2001) contradicted other studies (Biner et al., 1995; MacGregor, 2002; Ellis, 2003). She found temperament was not a predictor of student satisfaction in web-based courses. Stokes (2001) used the KTS to survey 145 students on web-based course satisfaction. From nominal level measures, most notably frequency distribution, Stokes did find that the study participant populations were significantly different from Keirse and Bates’ (1984) distribution of the general population. Using Keirse and Bates’ (1984) four temperament categories, Guardians comprised 71% of the study population versus 44% of Keirse and Bates’ (1984) general population; Idealists 19% study versus 30% general; Artisan 6% study versus 13% general; and Rational 3% study versus 14% general. However, Stokes (2001) reported no significant relationship existed after using Chi-Square for variables expressed as categorical data and one-way ANOVA. These findings run counter to other studies (Biner et al., 1995; Ellis, 2003; Macgregor, 2002) on the relationship between personality characteristics and distance education.

While these studies have opened up new areas of exploration in distance education and certainly in areas where researchers may begin to find answers to the questions of student personality types and online program success and retention, there is

no research as of this writing that specifically addresses the issue of student success and retention in online programs.

Research Questions

Given this known deficit in our current knowledge of the online student success and retention in an online course, as stated in Chapter 1, this study seeks to answer four questions:

1. Are certain online students more likely to succeed in the online format as a function of their personality factors?
2. Are specific online students more likely to have a higher retention rate in online courses as a function of their personality factors?
3. What is the demographic profile of a successful online student?
4. What is the demographic profile of a retained online student?

Setting

Olympic College is an urban based, but rural and urban serving, Washington State, 2-year public institution with a developing online presence. In 2004, because of the growing trend in online education in higher education, and as a natural extension of its existing distributed education program, Olympic College embarked upon providing an online element, but it did so relatively late in the online education explosion that hit academia after 1996.

Olympic College consists of three campuses and serves Kitsap and Mason counties in Washington. The college's main campus is located in Bremerton, Washington, and its two satellite campuses are located in Poulsbo and Shelton, Washington. The Poulsbo campus is 30 miles from the main campus, while the Shelton campus is located 60 miles from the main campus. These three campuses serve the

281,374 residents of Kitsap and Mason counties of Washington spread over 1617 square miles of wooded and lowland mountain terrain. In spite of being a mere seven air miles from downtown Seattle with its diversion metropolitan population, Kitsap and Mason counties' populations are predominantly white (84% Kitsap and 89% Mason), mostly between the ages of 25-54 (41% Kitsap and 45% Mason), and slightly more male (51% Kitsap and 52% Mason). From this service population base, Olympic College's student body is demographically, by largest represented groups, predominantly full time (59%), between the ages of 20-29 (38%), female (56%) and white (73%).

While establishing a second satellite campus in Poulsbo, Washington, from 1996 to 2006 to address the college's student population in remote locations, Olympic College developed a Distance Learning office as part of the college's Media Services Department. Retained under the Dean of Library Services, who already held responsibility for the Media Services Department, the new Media Services and Distance Learning Department added online courses to its existing telecourse inventory. Until 2008, growth in online offerings has been organic, originated from faculty without a strategic plan, and was done without much college-wide administrative oversight. In January 2008, the President of Olympic College announced the planned formation of a fourth campus to handle all distance education. This fourth campus—a Virtual Campus—is to be administered in the same fashion as the other satellite campuses under a dedicated administrative team for strategic planning, budgeting, growth leadership, and program development.

To date Olympic College has no organic online or distance degree program. As a result of Olympic College's membership in the Washington State Community and Technical Colleges state-wide cost sharing consortium, "Washington Online", Olympic College students are able to complete a degree from a distance through coursework that

combines Olympic College distance courses with courses through the other Washington State community and technical colleges. The lack of an organic online program has not slowed the college's continued growth in online enrollment.

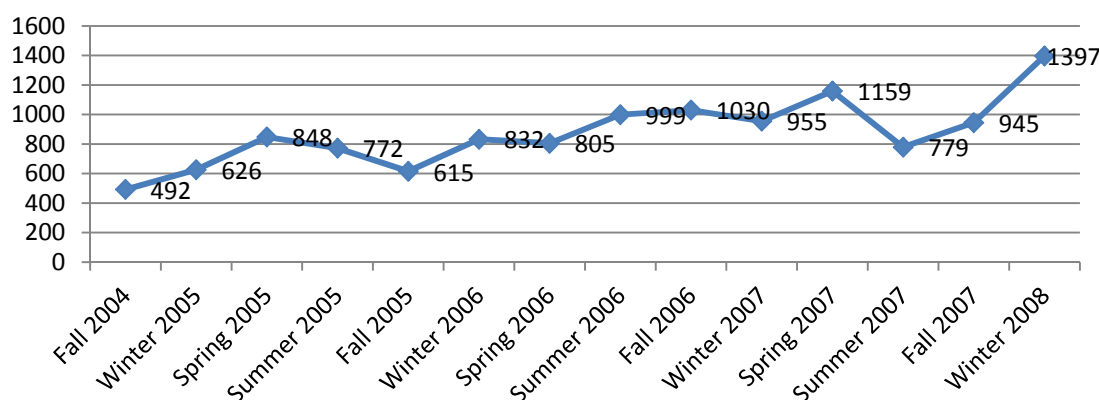


Figure 1. Olympic College online class enrollment

As shown in Figure 1, in fall of academic year (AY) 2004-2005, Olympic College offered 33 courses via online. 492 students were enrolled in these courses. In Spring AY 2006-2007, the number of courses offered by the college had jumped to 72 and the number of enrolled students jumped to 1159. The growth in student enrollment continues in an upward pattern. As a result of the growth trend, interest in factors contributing to online success and retention continues to be important to the college. Likewise, other community and technical colleges hold similar interests for a variety of reasons we explored in Chapter 1.

Participants

The participants for this study will be a self-selected sample of the entire online student population of classes taught at Olympic College since AY 2004/2005.

Inclusion criteria.

- A full or part time student at Olympic College from AY 2004/2005 to present,
- 18 years old or older.

- Enrollment in at least one Olympic College online course since AY 2004/2005
- Volunteer to participate

Exclusion criteria.

- Not enrolled as a student at Olympic College from AY 2004/2005 to present
- Under 18 years of age
- Not enrolled in an Olympic College online course from AY 2004/2005 to present
- Does not volunteer to participate

Unit of Analysis and Population Size

The analysis unit for this study will be one undergraduate student. Based upon general enrollment trends for Olympic College's online courses, the population size is estimated at 12,254 students. If we further plan that only 50% of the student records have valid current student e-mail addresses, we can assume that only 6,127 students will receive the invitation to participate. With a return rate of 10% of all invitations, the anticipated n for this study is 612.

Courses for the Study

All of the courses offered by the school and not cancelled by the school's administration during the 10 week term will be included in this study with no criteria for exclusion. The courses will cover a variety of disciplines under different instructors with different course designs and delivered on different course management platforms, but still part of the college's distance learning program.

All of the courses will be lower division undergraduate courses. The general class sizes in this study will be 25 students per Olympic College policy and practice, but some courses will have more.

The interactions in the classes participating in this study are predominantly asynchronous in the form of discussion boards and e-mails. Some classes will use synchronous chat, but this will not be standard or wide-spread. The structure and design of the courses are the prerogative of the course instructors so long as the course meets the course objectives accepted by the college curriculum committee. The participants will not meet face-to-face with each other or with the instructor at any time during the semester.

Instruments

All volunteering and participating students will complete the Keirsey Temperament Sorter (KTSII) survey. Their scores will be combined with demographic and academic information available in the student's records. This will constitute the needed information.

Keirsey Temperament Sorter II (KTSII)

The KTSII consists of 70 questions. Each question offers the respondent two choices for response and respondents are asked to select the one answer they prefer for each question. Each answer generates a numeric value for each of the eight personality factors. The eight personality factors and their groupings are listed in Figure 2.



Figure 2. Keirsey's eight personality factor groupings.

The four high scores from the pairs E/I, S/N, T/F, and J/P generate one of 16 possible personality types are listed in Table 3.

Table 3

Keirsey's Personality Types and Temperaments

Artisan (SP)		Rational (NT)	
ISTP	ISFP	INTJ	INTP
ESTP	ESFP	ENTJ	ENTP
Guardian (SJ)		Idealist (NF)	
ISTJ	ISFJ	INFJ	INFP
ESTJ	ESFJ	ENFJ	ENFP

For pair scores that come out equal, an X replaces the factor designating that the subject is balanced in both factors. Therefore, there are 32 mixed types besides the 16 previously listed. These 32 mixed types are shown in Table 4.

Table 4

Keirsey's 32 Mixed Personality Types

XNTP	EXTP	ENXP	ENTX	XNTJ	EXTJ	INXP	INTX
XNFJ	EXFJ	ENXJ	ENFX	XNFP	EXFP	INXJ	INFX
XSTP	IXTP	ESXP	ESTX	XSTJ	IXTJ	ISXP	ISTX
XSFJ	IXFJ	ESXJ	ESFX	XSFP	IXFP	ISXJ	ISFX

A list of the 70 questions in the KTSII is included in Appendix C. The test could be completed in 15-30 minutes and was at a simple reading level. The KTSII questions were administered through Zoomerang. This web-based software provided both aggregate scores as well as allowed individual scorings to be extracted. Base on Zoomerang's capability to extract all data as a spreadsheet, scores and questionnaire answers were married to student academic information in a separate database. Once the Zoomerang answers were received, the information was coded into a Microsoft Excel

spreadsheet in column form with each row representing a participant and each column representing a question from the KTSII. The eight personality traits were then be calculated automatically in the Excel spreadsheet for each student. The student's academic information will also be included in this additional database.

The following is a shortened example of how the data would look after it was collected:

Table 5

Data Collection Example Spreadsheet

Student Number	E	I	S	N	T	F	J	P	Question 1
7865	1	5	6	0	4	2	5	1	A
7866	4	2	3	3	5	1	4	2	B

Academic Information From the School Records

The academic information on each participant was obtained from Olympic College's admissions and records department. The college-derived academic information included only number of online courses attempted and final grades for online courses attempted. Only students who had agreed to have their records accessed were examined

Data Collection

The data collection was conducted in two phases: Invitation and Survey.

Inviting participants. Using the Olympic College Student Management System, the researcher drew out the names and e-mail addresses of all students who had participated in an Olympic College online course that meet the inclusion criteria. To draw this out, the researcher had the system query all files using the following query codes and parameters.

- YRQ = Year/Quarter
- ITEM = Course item number
- SID = Student ID number
- STU-BDAY= Student birth date
- STU-EMAIL = Student e-mail
- SORT = A561-A783 = academic year and quarter range to be queried
- SORT = SHOL,STOL,WEB,OCOL,WAOL = online course codes

From this list, all student ID numbers that have a birth year of 1990 or later were deleted. This left a list of all student IDs that had participated in an Olympic College online course in the last two academic years, that were 18 years of age or older, regardless of their current status or course grade and their associated e-mail addresses. This met the criteria for inclusion listed above.

The resulting list of e-mail messages from this query was transferred to the Zoomerang software. This allowed the researcher to send out a mass initial and a follow-up e-mail invitation to participate in the research. The wording for the invitation e-mail is in Appendix B. Within the e-mail received by the invited student is a link that took them to the Web-based survey instrument.

Survey. Students who wished to participate would click on the provided link that would redirect them to the survey Web site. The initial page of this survey was the Informed Consent page. Inherent within Zoomerang is a feature wherein the participant MUST scroll through the entire informed consent text before the "I accept" or the "I do not accept" radio boxes go from inactive to active. Participants must then select the "I accept" before proceeding further with the survey. If a participant selects the "I do not accept" option, Zoomerang's software redirects the participant to a "Thank You" page and

out of the survey. This is specifically designed to address Informed Consent. The Informed Consent text that participants saw was attached to the IRB application.

Upon acceptance of consent, the participant began the survey. Using the Zoomerang mandatory answer feature, the first question asked the participants for their student ID number. This was later used to link the individual results of the participant to their academic records AND it served as a query component in the subsequent data search in the Olympic College Student Management System. Following this the student took the 70 question Keirseley Temperament Sorter II.

Results from the Zoomerang software can be viewed in several ways but only two are of interest to this research. First, results can be viewed by individual respondents. The researcher used this view to extract the student ID numbers of participants in order to draw out the appropriate respondents academic records. Only the records of those who opted to participate and completed the 70 question Keirseley Temperament Sorter II were accessed. Incomplete surveys and all nonparticipating student information were destroyed at the end of the data collection period.

The second way results can be viewed that is of interest to the researcher is as an aggregate of all scoring in an extractable Excel worksheet. The researcher extracted the data from Zoomerang in this way and used the data in an Excel spreadsheet format for further analysis. Since this view did show individual rows for each participant, subsequent academic information was added to each row as was appropriate for the participant based upon the participant's academic records. These items included age, number of online courses in which enrolled, number of online courses completed, online course grades, and gender.

Protection of Human Subjects

Because the participants were students, albeit adults who were capable of making an informed consent by definition of their status, they met the qualification of a vulnerable population (Protection of Human Subjects, 2001). Therefore, specific safeguards were necessary to insure their privacy, respect their participation, and prevent any sense of threat in any decision they made to participate. The researcher placed attention on protecting subjects from the real or imaginary pressure to participate in the study. To this end, all information regarding which student did or did not participate in the study and any information that might identify participants in the study or/and connect them with the information gathered by the researcher would not be shared with instructors, staff or administration of Olympic College. Participants were notified in the Participant Consent Form (See Appendix B) that no instructor will be notified of who had and had not elected to participate in this study.

While students were asked to use their student identification number on the KTSII for later marrying of KTSII results with academic records of that student's success and retention, only the researcher had access to this master list of participating students. The researcher alone kept the master list of participant names, e-mails and their results if any. This master list was stored in a separate, secure location from all other data.

Data Analysis

All data were formatted into an Excel spreadsheet for further analysis. Data rows that were incomplete were dropped from the dataset.

First, nominal distributions were produced for each of the demographic attributes of age and gender to establish the initial enrollment make-up of the online students participating in the study. This consisted of all students who participated in the survey

regardless of their final grade or status. For example, all students who would later have dropped the course were included in this initial data run.

Second, an initial nominal distribution was produced for each of the eight personality traits to establish the initial enrollment make-up of the online students participating in the study with age and gender being aggregated. Additionally, nominal distributions were run for each of the eight personality traits separating both gender and age. These consisted of all students who participated in the survey regardless of their final grade or status. For example, all students who would later have dropped the course were included in this initial data run.

Third, the researcher ran an ANOVA for each of the eight individual personality traits and the participant's final course grade. This was used to establish a connection between temperament and student success in an online course. Additional ANOVAs were run to determine if age, gender, and personality trait in combination has any greater or lesser affect on student success.

Fourth, the researcher ran an ANOVA for each of the eight individual personality traits and the participant's "Retained" or "Nonretained" status. Student's having taken an online course in two of three subsequent terms were considered "Retained" for the purposes of this study. Students taking only one online course in three subsequent terms were considered "NonRetained". This was used to establish a connection between temperament and student retention in an online course. Additional ANOVAs were run to determine if age, gender, and personality trait in combination have any greater or lesser effect on student retention in an online course.

Fifth, to address the first research question, "Successful" constituted a grade of C/2.0 or above. "Unsuccessful" constituted a grade of D/1.9 or below, withdrawals and

incompletes. A nominal distribution of temperament sorts was established for “Successful” and “Unsuccessful” participants.

Sixth, to address the second research question, “Retained” constituted the participant’s completion of at least one online course within each of any two of the previous three terms. “Nonretained” constituted the participant’s completion of less than one online course within each of any two of the previous three terms. A nominal distribution of temperament sorts will be established for "Retained" and "Nonretained" participants.

Seventh, to address the third research question, the researcher ran a nominal distribution for each demographic attribute between both the successful and nonsuccessful online students.

Finally, to address the fourth research question, the researcher ran a nominal distribution for each demographic attribute between both the retained and nonretained online students.

Descriptive statistics were used to analyze, describe and report data.

Limitations of the Study

1. In this study, the courses were taught by a variety of instructors in a variety of teaching styles making it difficult to control for variations and presentations.
2. This study examined the participants as a whole rather than as individuals to reduce this limitation.
3. This study examined only one term of one university’s online distance education program.

4. This study would not be generalizable to a larger student population. Participants in this study were geographically dispersed making communication difficult.

Summary

This study examined personality differences between successful and unsuccessful online students, and retained and nonretained online students. This study used the KTS/KTSII and a researcher designed SIS in computer-based format to determine personality and demographic types. It is hoped that by determining if personality is a factor in student success and retention online, further emphasis can be placed on assisting the students in selecting courses that are better suited to them. In doing this, the college or university would be upholding more of its responsibility for the successful education of its students.

Chapter 4: Results

College and university administrators are looking to online education as a means to attract more students whose tuition could offset limited state and federal funding. (Kolowich, 2009) Yet, with online education courses within public colleges and universities realizing lower than average retention and success rates for students, current retention practices and models are falling woefully short of providing workable, viable answers to keeping students and helping them be successful without lowering standards. Thus the problem becomes identifying factors in common in successful and retained students in online courses. This study sought to determine the relationship between the personality types of online students and their success and retention in online programs. In identifying this element, institutions may be able to better advise and counsel students on their likelihood of doing well in online courses of various pedagogic models, measured in retention, satisfaction and learning. In this alone, the value of studying persistent online student personality types to improve the retention of online students becomes apparent. To that end, this study posed four research questions.

1. Are certain online students more likely to succeed in the online format as a function of their personality factors; that is, is there a difference in personality factor score for each of the eight KTS personality types based on degree of success in the course?
2. Are specific online students more likely to have a higher retention rate in online courses as a function of their personality factors; that is, is there a difference in personality factor score for each of the eight KTS personality types based on degree of retention in the course?

3. What is the demographic profile of a successful online student?
4. What is the demographic profile of a retained online student?

The survey was conducted in the summer of 2009 using enrollment data from the Spring 2009 academic term. A data search of the student management system software used by Olympic College allows for particular search criteria to be used as a filter in student selection. Search criteria were set for all students who took an online course during the Spring 2009 academic term and who were 18 years or older. 1673 students occupied 2108 course spaces in that term. Of the 1673 students, 208 were under the age of 18 and therefore ineligible to take part in the survey. The remaining 1465 students were eligible. Their names became the foundation data set for this study.

The search criteria also included the student identification number assigned to the student by the college, the student's name, zip code, course title, course identification number, instructor's name, the student's final course grade, the student's final numeric grade, and the student's email address. The search results file was exported to Excel as a spreadsheet. In Excel an additional column was added to the spreadsheet for a study specific alpha-numeric identifier code that would later be used to link student information with survey results to protect student identity. As all 1465 students were invited to participate, no randomizing for further selection was necessary.

An initial email invitation as described in Chapter 3 and Appendix A was sent to every eligible student during the first week of the summer 2009 term through a simple mail merge in the Office Suite. This initial email returned less than 50 completed surveys. Second and third reminder and invitation emails were sent out to all students who had not returned a completed survey by the second and fourth week after the initial invitation. With each successive re-invitation approximately 50 students would reply with a

completed survey. Access to the survey to all students was closed at the end of the summer 2009 term. In total through an initial invitation and two subsequent invitations to participate, 149 students completed both the Keirsey Temperament Sorter II and the student demographics survey for 149 complete data sets. This constituted a 10.17% complete survey return rate, which is statistically significant.

Next, the academic online history of each of these 149 students for the 2008-2009 Academic Year was drawn from the student management system. This information included the student's college number, each online course title the student had been enrolled in over that academic year and its course identifier number, the course instructor's name, student's final respective course grade and student's final respective course numeric grade. This information was exported to a second Excel spreadsheet and additional columns were added to this spreadsheet for student alpha-numeric identifier, temperament results, gender, age, ethnicity, marital status, household income (as reported by the students), number of children of child care age (as reported by the students), and retained/not retained. This allowed for later analysis of retention and grade success or nonsuccess for each course associated with that temperament type. Over the span of one academic year (Summer 2008—Spring 2009), the 149 students yielded 496 records for analysis with some students taking only one online course in that period and others taking as many as seven.

Finally, the data set was purged of student identifying information to protect student identity. The purged fields were student college identification number, student email address, and student name. This produced two data sets, the first profiling online students who were successful or unsuccessful ($n = 496$) and the second profiling retained or not retained students ($n = 149$). The initial data set with identifying student

information and the initial search results were then destroyed leaving no traceable student identification.

Demographics Descriptive Analysis

All survey information, both for the KTSII and the additional demographics survey, was analyzed first with descriptive statistics, namely frequency distribution and percentages in Microsoft Excel. Each category of temperament and each question was assigned a column with each complete respondent assigned a row. Response frequencies for each category were recorded, calculated, analyzed, and demonstrated through a bar chart. All 149 students reported their genders allowing for coding of all 469 course records. Data indicated that female students dominated the total sample of online students (69%, $n = 342$). Figure 3 represents the distribution of gender of the participants.

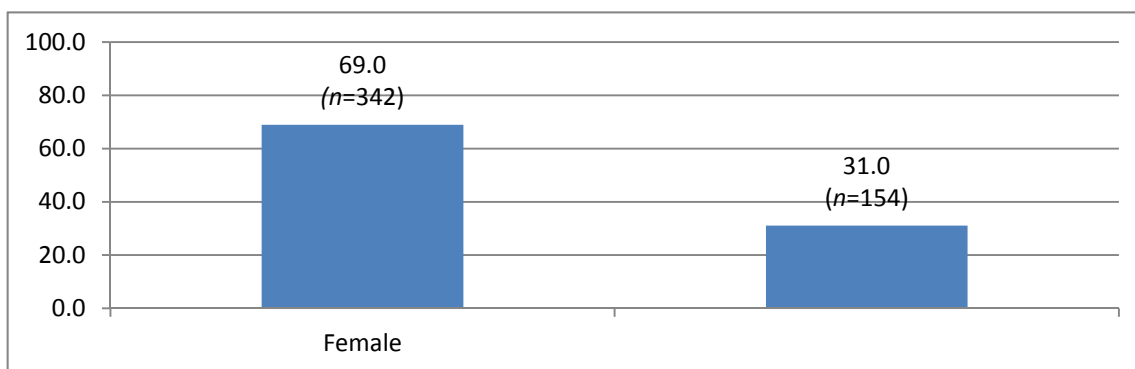


Figure 3. Gender Distribution of participants.

All 149 respondents reported their age. Data indicated that online students 18-25 constituted the largest single grouping of the sample population (32%, $n = 160$). However, 68% ($n = 336$) of all online students were 26 years of age or older. Figure 4 represents the distribution of age for the participants.

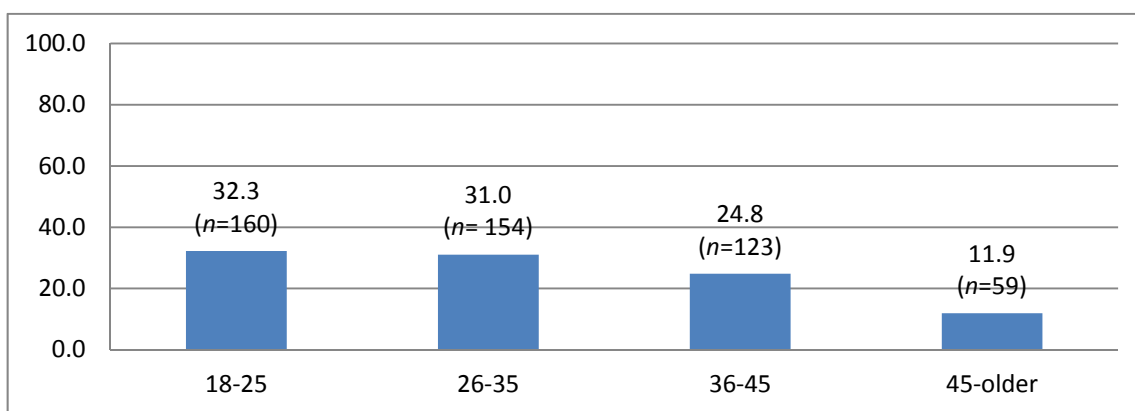


Figure 4. Age distribution of participants.

All 149 respondents reported their ethnicity. Data indicated that Caucasian students were more strongly represented among all online students (92%, $n = 455$) in this study as compared to the next most represented group, African-Americans (2%, $n = 12$). Figure 5 represents the distribution of ethnicity for the participants.

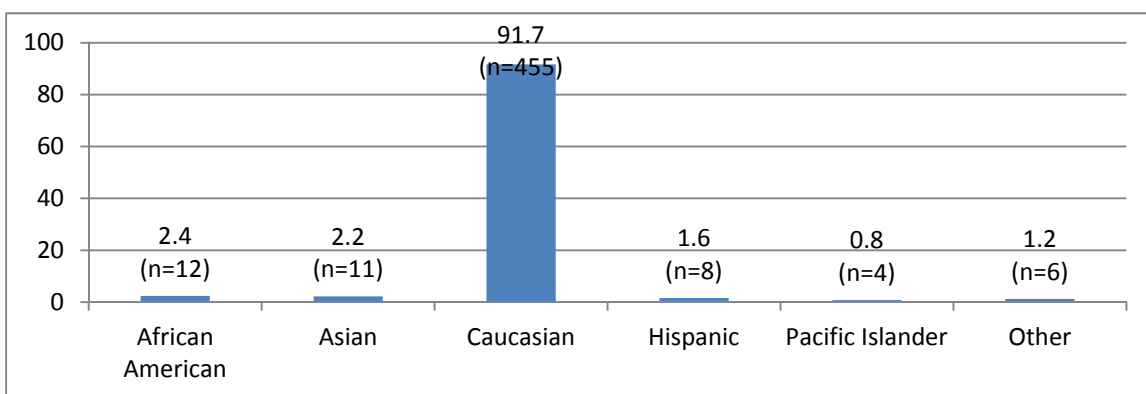


Figure 5. Ethnicity distribution of participants.

All 149 respondents reported their marital status. From the sampling, data indicated that online students are more likely to be married or in a committed long term relationship (63%, $n = 313$) rather than divorced ($n = 54$) or single ($n = 129$). Figure 6 represents the distribution of marital status of the participants.

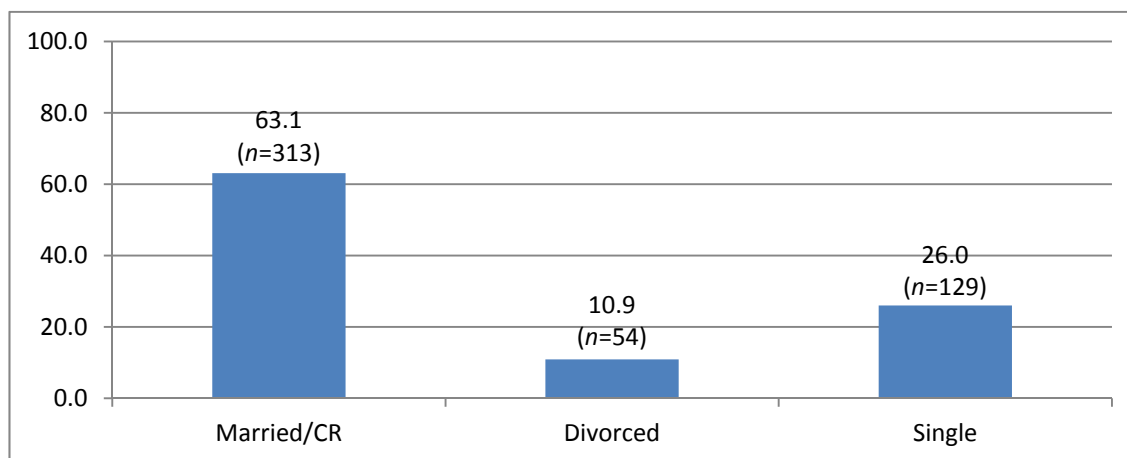


Figure 6. Marital status distribution of participants.

All 149 respondents reported the number of children in their household who are of child care age. Data indicated that online students with no children of child care age (36%, $n = 178$) constituted the largest single group of the sample population. However, data also indicated that 64% ($n = 318$) of all online students sampled had one or more children of child care age. Figure 7 represents the distribution of number of children of child care age among respondents in this study.

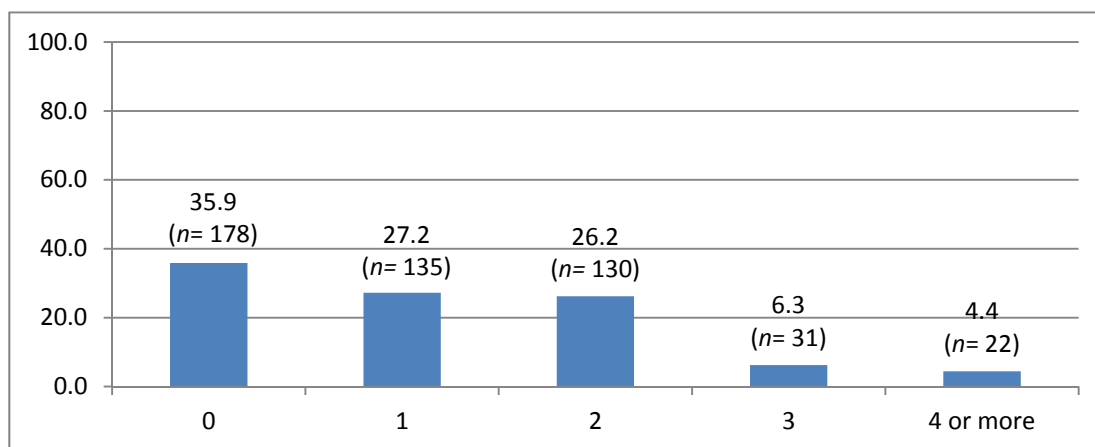


Figure 7. Distribution of number of children of child care age.

All 149 respondents reported their Household Income. Respondents with household incomes at or above \$72,001 were the largest single group (31%, $n = 135$) of all respondents reported a household income being at or above \$72,001. However, 69%

($n = 343$) of all online students had household incomes at or less than \$72,000 with 58% ($n = 286$) with household incomes at or below \$52,000.

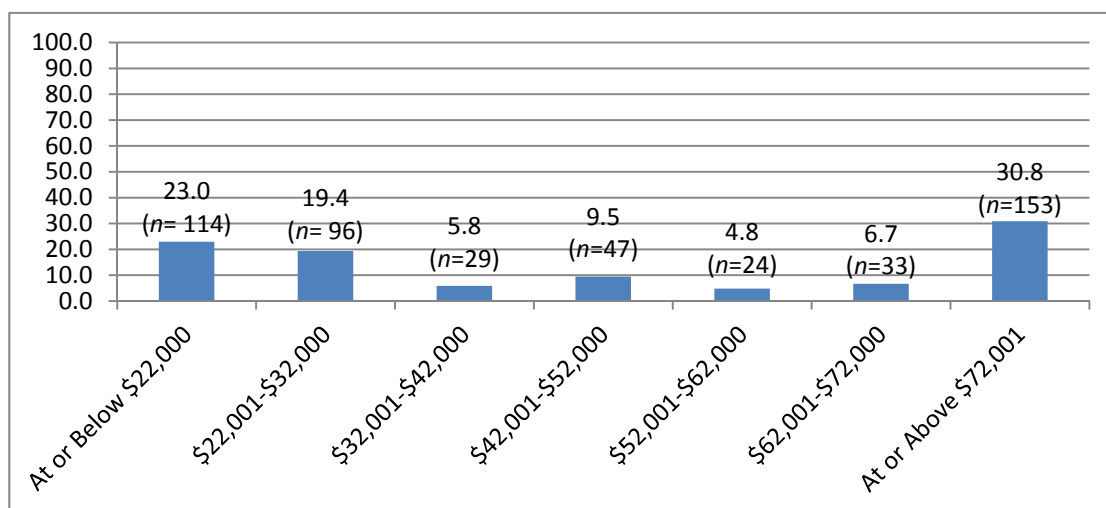


Figure 8. Household income distribution of participants.

All 149 respondents completed the KTSII survey. The KTSII results were connected to each respondent's academic history yielding 496 complete records for analysis. Data indicated that Keirsey's Guardians (59%, $n = 272$) represented more strongly in online courses than Keirsey's Idealists (34%, $n = 167$), Artisans (8%, $n = 40$) or Rationals (3%, $n = 17$). Drilling down, the data indicates that ISTJ ($n = 87$), ISFJ ($n = 82$), INFJ ($n = 75$), and ESFJ ($n = 60$) were the highest represented individual temperaments. Figure 9 represents the distribution of temperaments individually and by Keirsey's four classification groups.

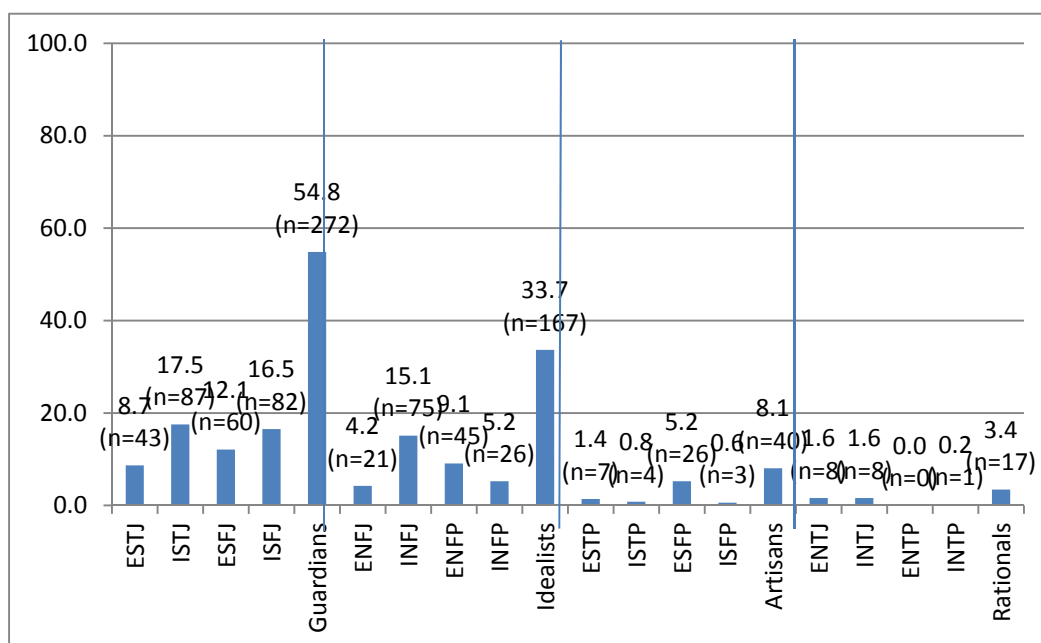


Figure 9. Temperament distribution of participants.

It should be noted that while process preferences toward individual temperament elements does exist, and is fundamental to establishing a respondent's temperament, these are preferences only. Human preferences are never static and thus numerical values that the KTSII generates to indicate preference in a particular category will change based upon multiple environmental variables. As such, at the individual level, temperament research beyond the four designator level is ill-advised.

Additional Statistics

Academic results of the 149 respondents yielded 496 individual course grades for analysis. In addition to other specified statistics collected, final course grades were collected and analyzed. 62% ($n = 301$) of all online students who participated in the study received a grade of "A". Of the remaining 38% of online students, 28% received a passing grade (B = 15%, $n = 75$; C = 9%, $n = 43$; P = 4%, $n = 18$). Figure 10 indicates the distribution of grades for online students in the study.

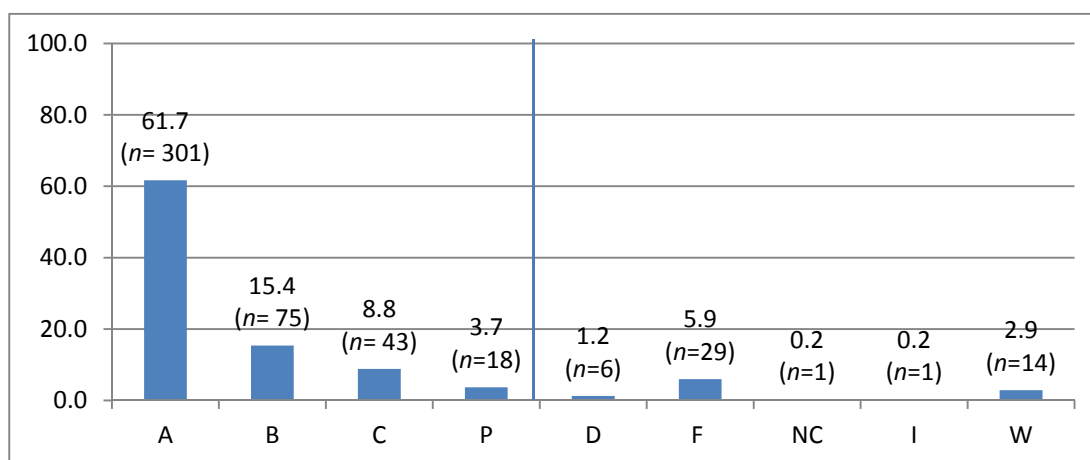


Figure 10. Grade distribution by percentage.

Findings

The following are the findings for each research question posed in this study. Research question one as previously reported in Chapter 1 asked: Are certain online students more likely to succeed in the online format as a function of their personality factors; that is, is there a difference in personality factor score for each of the sixteen KTS personality types based on degree of success in the course? To determine if personality has an influence on student success in online courses, an ANOVA was conducted. Analysis of variance (Table 6) indicated that the findings were significant at the 0.0639 level indicating that temperament has influence on online student success. There is a statistically significant different in success based upon personality type.

Table 6

Analysis of Variance Table

Source Term	DF	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (Alpha=0.05)
A: TEMP	14	42.17477	3.012483	1.65	0.063982	0.8911
S	481	880.7178	1.831014			
Total (Adjusted)	495	922.8926				
Total	496					

Fisher's LSD Multiple Comparison Test was conducted to determine if there were differences in the subgroups of the independent variable (temperament). Table 7 and Figure 11 report the average final course numeric scores of respondents. The four highest means are achieved by ESTP (3.93), ISTP (3.83), INTJ (3.68), and ESTJ (3.56). The four lowest means are INTP (0.00), ISFP (2.53), ESFP (2.74), and ESFJ/ENFP (2.82 each).

Table 7

Course Final Numeric Scores

Temperament	Count	Mean	Standard Error
All	496	2.94	
ENFJ	21	2.90	0.2952815
ENFP	45	2.82	0.2017156
ENTJ	8	2.88	0.4784107
ESFJ	60	2.82	0.1746909
ESFP	26	2.74	0.2653745
ESTJ	43	3.56	0.2063534
ESTP	7	3.93	0.5114425
INFJ	75	3.11	0.1562483
INFP	26	3.20	0.2653745
INTJ	8	3.68	0.4784107
INTP	1	0.00	1.35315
ISFJ	82	3.12	0.1494304
ISFP	3	2.53	0.7812414
ISTJ	87	3.04	0.1450729
ISTP	4	3.83	0.6765748

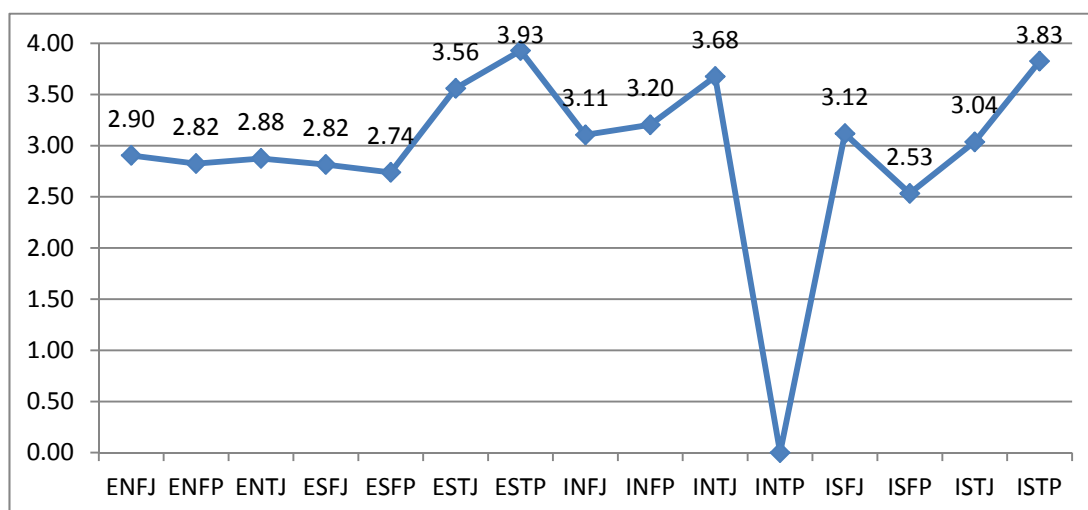


Figure 11. Grade mean of participants by temperament.

Research question two as previously stated in Chapter 1 asked: Are specific online students more likely to have a higher retention rate in online courses as a function of their personality factors; that is, is there a difference in personality factor score for each of the sixteen KTS personality types based on retention in online courses? To determine if personality has an influence on higher retention rates in online courses, Chi-Square analysis was conducted on the sixteen KTS personality types and retention states. Table 8 reports these findings.

Table 8

KTS Personality Types and Retention States

Temperament	Not Retained	Retained	Count
ENFJ (Count)	0	21	21
(Expected)	1.4	19.6	21
(Chi Square)	1.35	0.09	1.44
ENFP	5	40	45
	2.9	42.1	45
	1.51	0.1	1.61
ENTJ	0	8	8
	0.5	7.5	8

(table continues)

Temperament	Not Retained	Retained	Count
	0.52	0.04	0.56
ESFJ	7	53	60
	3.9	56.1	60
	2.53	0.17	2.7
ESFP	1	25	26
	1.7	24.3	26
	0.27	0.02	0.29
ESTJ	2	41	43
	2.8	40.2	43
	0.22	0.01	0.23
ESTP	0	7	7
	0.5	6.5	7
	0.45	0.03	0.48
INFJ	2	73	75
	4.8	70.2	75
	1.67	0.11	1.78
INFP	0	26	26
	1.7	24.3	26
	1.68	0.12	1.8
INTJ	0	8	8
	0.5	7.5	8
	0.52	0.04	0.56
INTP	1	0	1
	0.1	0.9	1
	13.56	0.94	14.5
ISFJ	7	75	82
	5.3	76.7	82
	0.55	0.04	0.59
ISFP	1	2	3
	0.2	2.8	3
	3.36	0.23	3.59
ISTJ	6	81	87
	5.6	81.4	87
	0.03	0	0.03
Total	32	464	496
	32	464	496
	28.48	1.96	30.44
Chi Square	30.440696		

(table continues)

Temperament	Not Retained	Retained	Count
Degrees of Freedom	14		
Probability Level	0.006633		

The p-value is 0.006633 less than .05 indicating that there is a difference in the personality type of students who are retained for more than one course and whether they took more than one online course in a three-term period. There were more than the expected number of students with typologies of INFP (26/24.3/1.06) and INFJ (73/70.2/1.03) who were retained, and fewer than the expected number of students with typologies of ESFJ (3.9/7/0.557) and ISFJ (5.3/7/0.757) who were retained.

It should be noted some of the cells in the cross-tabulation table had fewer than 5 expected frequencies including zeros. As such, the findings should be used more as an indicator that a relationship may exist as opposed to generalized findings. Larger sample sizes will be needed in future studies to avoid this issue.

Similarly, a Chi-square test was conducted to determine if there was a difference in retention based on temperament elements. The results are summarized in Table 9.

Table 9

Chi-Square and Individual Temperament Characteristics

Variable	p-value	Findings
I/E	0.591	There is no statistically significant difference in retention based on I/E
N/S	0.140	There is no statistically significant difference in retention based on N/S
F/T	0.210	There is no statistically significant difference in retention based on F/T
J/P	0.735	There is no statistically significant difference in retention based on J/P

Research question three as previously stated in chapter 1 asks: What is the demographic profile of a successful online student? To determine if demographic factors

influence online student success, ANOVAs and *t*-tests were conducted as appropriate. A correlation analysis was used to determine the relationship between success and age of respondents. Table 10 below reports a summary of the findings.

Table 10

Demographic Profile of Successful Online Students

Variable	p-value	Findings ($p > 0.050$)
Gender	0.3929	no difference
Ethnicity	0.6498	no difference
Marital Status	0.1967	no difference
Household Income	0.00329	statistically significant - five highest (3.86), one lowest (2.79), the rest (2.95-3.84)
Children of Child Care Age	0.2143	no difference
I/E	0.433	no difference
N/S	0.620	no difference
F/T	0.0458	T(3.24) > F (2.98)
J/P	0.3768	no difference

Research question four as previously stated in Chapter 4 asks: What is the demographic profile of a retained online student? To determine if demographic factors influence student retention in online courses (participating in more than one online course over a 3-term period), Chi-Squares were conducted on each of four factors in the study—gender, ethnicity, marital status, and household income. A *t*-test was conducted on age and number of children of child care age in the home. Table 11 summarizes the findings.

Table 11

Demographic Profile of Retained Students

Variable	p-value	Findings
Gender	0.711	p-value > 0.05. There is no statistically significant difference in success based on Gender.

(table continues)

Variable	p-value	Findings
Ethnicity	0.000041	p-value is less than α . There is a statistically significant difference in success rates based upon Ethnicity. More Asian and Hispanic students than expected were not retained. It should be noted some of the cells in the cross-tabulation table had fewer than 5 expected frequencies. As such, the findings should be used more as an indicator that a relationship may exist as opposed to generalized findings. Larger sample sizes will be needed in future studies to avoid this issue.
Marital Status	0.7909	p-value > 0.05. There is no statistically significant difference in success based on Marital Status.
Household Income	0.4136	p-value > 0.05. There is no statistically significant difference in success based on Household Income.

An Analysis of Variance was conducted to determine if there was a difference in retention based upon the Number of Children of Child Care Age, Age of Online Students and student retention. Table 12 summarizes the findings.

Table 12

ANOVA for Number of Children and Age of Online Students and Retention

Variable	p-value	Finding
Number of Children of Child Care Age	0.843	p-value > 0.05. There is no statistically significant difference in success based on Number of Children of Child Care Age.
Age	0.195	p-value > 0.05. There is no statistically significant difference in success based on a student's age.

Finally, a Chi-Square analysis was conducted to determine if retention rates were different based on the individual temperament elements of the KTSII. Table 13 presents a summary of the results.

Table 13

Chi-Square Analysis of KTSII Elements and Retention

Variable	p-value	Findings
I/E	0.5912	p-value > 0.05. There is no statistically significant difference in success based on Introvert/Extravert status.
N/S	0.143	p-value > 0.05. There is no statistically significant difference in success based on iNtuitive/Sensing status.
F/T	0.6396	p-value > 0.05. There is no statistically significant difference in success based on Feeling/Thinking status.
J/P	0.7350	p-value > 0.05. There is no statistically significant difference in success based on Judging/Perceiving status.

As can be seen in all four cases, no statistically significant differences were observed. It can be concluded that the individual components of the KTSII have no bearing on students being retained for more than one online course.

Summary

With college and university online education realizing lower than average retention and success rates for students, current retention practices and models are falling woefully short of providing workable, viable answers to keeping students and helping them be successful without lowering standards. In the summer 2009, 149 students from Olympic College yielding 496 data lines participated in this study to determine the relationship between the personality types of online students and their success and retention in online programs.

A demographic analysis of the participants found that females (69%, $n = 342$) were more strongly represented in the study. 68% ($n = 336$) of all online students were 26 years of age or older. Data indicate that Caucasian students were more strongly represented among all online students (92%, $n = 455$). Online students in the study were more likely to be married or in a committed long term relationship (63%, $n = 313$) than

not with one or more children at home of child care age (64%, $n = 318$) and living in households with incomes less than \$52,000 per year (58%, $n = 286$). The typical online student was also found to most likely be a generally categorized as a “Guardian” temperament (55%, $n = 272$) and specifically more likely to be an ISTJ ($n = 87$) or an ISFJ ($n = 82$). Finally, over the span of the academic year, online students were more likely to receive an “A” final grade (62%, $n = 301$) than any other grade.

Among successful online students, temperaments ESTP, ISTP, INTJ, and ESTJ were more likely than all other temperaments to be successful based upon final course grade. Personality was also found to be an influencing factor in online student retention measured as a student taking more than one online course in a three-term period. There were more than the expected number of students with typologies of INFP and INFJ retained than all others.

The temperament element of Feeling/Thinking was found to have an influencing effect on student success, as was household income, but no other demographic variable was found to have an influence on online student success. Ethnicity was a statistically significant influence on student retention with Hispanic and African-American students being less likely to take more than one online course in a year. No statistically significant differences were observed for influences on demographics by the individual components of the KTSII so it can be concluded that the individual components of the KTSII have no bearing on students being retained for more than one online course.

Chapter 5: Discussion

While a relationship between specific occupations and personality types have been noted (Briggs Myers & McCaulley, 1985; Briggs Myers & Myers, 1980; Kroeger & Thuesen, 1988), little research currently exists linking personality type and the success of a student in an online distance learning course. Even less research examines the relationship between personality type and online student retention. In spite of this lack of empirical evidence examining personality type as a factor in an online student's success or retention in an online course, research has examined overall low student success and retention rates in online courses and some demographic factors have been associated with online course work. However, quantifying student success and retention rates does not address maximizing the learning experience for online students. And while some demographic understanding of online students is necessary, demographics alone are too simplistic and vague as identifiers for designing positive online learning environments or of providing good student advising. Deeper qualities influence student success and learning design. Learning styles coupled to a student's internal processing of the world around her/him dictate what information a student encounters will be contextualized into knowledge and what information will be discarded as useless trivia.

In Thompson's (1998) review of research literature to that point, the typical distance learner (all forms of distance education were considered) is older than the typical undergraduate, female, more likely to be employed full-time, and married. While Thompson (1998) found that the "traditional" distance education student had difficulty attending college because of geographic remoteness, he also found this caricature is changing. Thompson indicated that more students are choosing distance education without consideration to their proximity to campus. This may lead to speculation that

distance education modes are less for “distance” and that other factors may be involved in student selection of this mode. While helpful for distance course marketing, Thompson’s findings fall short of being useful in determining a student’s success or retention in the online modality or of offering help in good online course design. Choosing distance education courses over traditional brick-and-mortar courses does not necessitate that students are more or less successful or retained.

In his doctoral dissertation research and later in several articles examining student retention, Diaz (2000) found that online students tended to be older, generally have completed more college credit hours and more degree programs and have a higher all-college GPA prior to entering an online course than traditional college students entering a traditional setting course. Subsequent studies have confirmed this general demographic finding (MacGregor, 2000, 2002). Studies of distance education repeatedly indicate that students participating in distance education courses of all types are more likely to drop out or not complete the course when compared with the same course in the traditional face-to-face setting. Carr (2000) reported that some institutions are seeing less than 50% of students completing online courses, and McVay-Lynch (2002) reported rates as high as 75% of students not completing web-based courses. Diaz argued that while “drop rate” has become somewhat synonymous with “academic nonsuccess”, this may be a misnomer in the online environment. In support he makes the supposition that older and more academically experienced would be more keenly aware of their GPA and the means to maximize that GPA, which would include dropping a course rather than being assigned a D or F score (a clear sign of academic nonsuccess). He went on to suppose that by doing the “right thing” (Diaz, 2002), they are exhibiting behaviour consistent with mature, well-informed and rational decision making and not behaviour of impetuous

youth and inexperience. While informative, this research does not address (only supposes) student motivation for nonsuccess and nonretention. Admittedly course design and student temperament were not the primary focus of this research, the omission of these or of student learning style is indicative of a wider shortfall in current online literature.

A number of studies have examined student experiences and characteristics in a variety of computer-mediated or computer enhanced courses including online courses (Richards, 1992, 1995; Westbrook, 1999), computer-mediated communication (CMC) courses (Blocher, 1997), and computer-assisted instruction (CAI; Ayersmann & von Minden, 1995; Broughton, 1986; Howard, 1986; Meunier, 1996; Pocius, 1991; Suddendorf, 1986). These studies looked at several student characteristics including personality (Broughton, 1986; Ellis, 2003; Howard, 1986; MacGregor, 2000, 2002; Meunier, 1996; Pocius, 1991; Stokes, 2001; Suddendorf, 1986), learning styles (Ayersmann & von Minden, 1995), student attitudes (Pocius, 1991; Westbrook, 1999), gender (Blocher, 1997), and demographic characteristics (Richards, 1992, 1995). While some of these studies provide positive information for researchers in understanding students in online learning (Blocher, 1997; Westbrook, 1999), most findings provided little information or inconsistent and sometimes insignificant results thus beckoning more research be done.

With online education courses within public colleges and universities realizing lower than average retention and success rates for students, current retention practices and models are falling woefully short of providing workable, viable answers to keeping students and helping them be successful without lowering academic standards. Thus the problem becomes identifying factors in common among successful and retained students

in online courses. This study sought to determine the relationship between the personality types of online students and their success and retention in online programs. In identifying this relationship, institutions could better advise students on their likelihood of doing well in online courses of various pedagogic models, measured in retention, satisfaction and learning. In this alone, the value of studying persistent online student personality types to improve the retention of online students becomes apparent. To that end, this study posed four research questions:

1. Are certain online students more likely to succeed in the online format as a function of their personality factors; that is, is there a difference in personality factor score for each of the eight KTS personality types based on degree of success in the course?
2. Are specific online students more likely to have a higher retention rate in online courses as a function of their personality factors; that is, is there a difference in personality factor score for each of the eight KTS personality types based on degree of retention in the course?
3. What is the demographic profile of a successful online student?
4. What is the demographic profile of a retained online student?

Methodology

As noted in Chapter 2, there is a noticeable void in the research literature and designs on personality differences or influences with respect to online students. As a side result of this void, the design of this research, while not unique in general, treads on little walked ground.

In the Summer 2009, 149 students from Olympic College in Washington State participated in two surveys, the Keirsey Temperament Sorter II and a demographics

detail survey, to assist in the research of the influence of personality type on online student success and retention. These 149 students completed both surveys providing all of the required research data for demographics and personality. Their academic grades for online course work over the 2008-2009 academic year was then combined with this data yielding 496 full data lines in this study.

All survey information, both for the KTSII and the additional demographics survey, were analyzed first with descriptive statistics, namely frequency distribution and percentages. To determine if personality has an influence on student success in online courses, an ANOVA was conducted. To determine if personality has an influence on higher retention rates in online courses, Chi-Square analysis was conducted on the sixteen KTS personality types and retention states. Similarly, Chi-square was conducted to determine if there was a difference in retention based on temperament elements. To determine if demographic factors' influence online student success, ANOVAs and *t*-tests were conducted as appropriate. To determine if demographic factors influence student retention in online courses (participating in more than one online course over a three term period), Chi-Squares were conducted on each of four factors in the study—gender, ethnicity, marital status, and household income. A *t*-test was conducted on age and number of children of child care age in the home.

Limitations

As with any research, there are limitations that are discovered within the design or implementation as the investigation was conducted. This research was no exception. While these limitations do not necessarily devalue the findings of this study, they are noteworthy for future research.

The first limitation of this study is its inclusion of only one institution. 149 students completed both the Keirsey Temperament Sorter II and the student demographics survey for 149 complete data sets. This constituted a 10% complete survey return rate for the quarter surveyed making the subsequent results statistically significant. Because only one college participated in this research, generalizability of the findings to other schools is questionable. Further research involving the inclusion of more community colleges either in the Puget Sound area, Washington State or wider is recommended for generalizability of the results.

Next, Olympic College's service area is predominantly Caucasian with a less than the national norm representation from other ethnic populations. Due to the poor representation of ethnic minorities in this survey, ethnicity data from this study is not generalizable. Additionally, two factors that were not specifically addressed in this study but uncovered, and possibly account for this ethnic dimension, were that (a) Olympic College's online faculty are overwhelmingly Caucasian and (b) that the instructional designs of the courses are decidedly Euro-centric. Future research could shed more light on the impact of different online instructional designs and student/faculty interactions on different ethnic groups.

Third, while the original study design rested upon the assumption that inclusion of all online courses within the school would control for differences in online course design differences (high-touch to no-touch), it was not anticipated that so many courses would be of one particular design and that that design would be low interaction. In the overwhelming majority of courses offered online in Academic Year 2008-2009 (234 of 329 sections by 151 instructors), course interaction logs show that Olympic College faculty posted to class discussion boards less than once per day. Further, the postings

made were generally to answer a question rather than to build community or dialectic inquiry. This unanticipated factor raises the question as to the degree it influences the findings. This third limitation is believed to have had an influence on the self-selection of Guardians to online courses. This temperament category's character trait of diligence and strong work ethic would inherently opt to take a course regardless of the design in order to achieve a higher goal—presumably to graduate regardless of their preference for or against that design. This would help to explain the high enrollment percentage of Guardians but their lower representation in general success in online courses observed in this study. Future research should more closely account for instructional designs, student/instructor and student/student interactions within an online course, and their impact on both online student satisfaction and success. If this research would also account for student preferences and success with student temperament it would be valuable information for instructional design. More research is needed also to determine whether course instructor conduct in the classes had an effect on the temperaments that were more successful or retained.

Grade inflation, the fourth limitation, at Olympic College was especially significant. Between Summer 2000 and Summer 2009, 42% of all of Olympic College's online students earned a 3.5 or higher final grade in their online course. Between Summer 2008 and Spring 2009, a staggering 62% of all students who enrolled in one of Olympic College's online courses earned a 3.5 or higher final grade in their online course. Grade inflation will remain the unspoken sin of American higher education with few faculty bodies, faculty unions or institution administrations addressing the issue with any vigor. However, among the debate points in this needed discussion, beyond the moral and ethical issues of grade inflation and devaluing the meaning of grades, grade inflation also

corrupts any faculty argument of self-governance or self-assessment on the effectiveness of the learning process within the institution. In effect, it defeats a faculty's ability to justify its own effectiveness for accreditation and for the work for which the faculty is responsible. In the case of this study, the unrealistic grade inflation at Olympic College makes the results associated with the "successful" student questionable at very best. Without more data points from a wider variety of community colleges the results of the "successful" student are not generalizable. Any future research would also have to account for the grade inflation of each researched institution and possibly a norming or measurable skew of grade inflation by institution throughout the higher education system.

Next, while this study sought to examine personality as a factor in online student success and retention by determining if differences between successful and retained online students and unsuccessful and not retained online students existed, it could be argued that a comparison between the found factors and those of the successful and retained or unsuccessful and not retained student in the general population of the institution would have been more meaningful. Further it could be argued that a comparison between the findings of this study and the general demographic or personality profile of the institution would have been likewise more meaningful. Future research should include and account for the personality profile of the institution's general population of student in comparison to that institution's online student population.

Sixth, it should be noted some of the temperaments had fewer than 5 expected frequencies including zeros within the survey population. This places in many cases the sample population out of alignment with the general population reported by Keirse (1998), Keirse and Bates (1984), and Montgomery (2002). As such, the findings should be used more as an indicator that a relationship may exist as opposed to predictive and

generalizable findings. Larger sample sizes will be needed in future studies to avoid this issue.

The final area of concern lies in the snapshot nature of the study. While all online students of one institution for an entire term were invited to participate and while the return rate was statistically significant, a more comprehensive longitudinal study might yield different results. Additionally, the results of such a study across several colleges would be more generalizable.

Demographic Findings

A demographic analysis of this study's participants found that females (69%, $n = 342$) were more strongly represented in the study. 68% ($n = 336$) of all online students were 26 years of age or older. Data indicates that Caucasian students were more strongly represented among all online students (92%, $n = 455$). Online students in the study were more likely to be married or in a committed long term relationship (63%, $n = 313$) than not with one or more children at home of child care age (64%, $n = 318$) and living in households with incomes less than \$52,000 per year (58%, $n = 286$). The typical online student was also found to most likely be a generally categorized as a "Guardian" temperament (55%, $n = 272$) and specifically more likely to be an ISTJ ($n = 87$) or an ISFJ ($n = 82$). Finally, over the span of the academic year, online students were more likely to receive a final grade point average of 3.5 or higher (61%, $n = 301$) than any other grade in their online course. These findings corroborate earlier findings of the same (Richards, 1992, 1995) showing online students tending to be female, older, fully employed, and part time students. It also lends more evidence to support Pocius' work. Pocius (1991) reviewed research on computer-assisted instruction (CAI). Students typically work in an individual, self-pacing environment where there is little social,

cognitive or emotional support from, or exchange with, other individuals. Accounting for the fact that this study did not directly examine motivation or the work environment, and given the demographic profile of the students uncovered in this study, the demographic profile accommodates Pocius' review findings.

Several issues may be at play to explain this demographic profile. First, online students tended to be older, which may account for the presence of children and a committed relationship. Age brings with it the development of family and a plethora of issues surrounding it (e.g. home, jobs, time management, and desire for improved quality of life). This nontraditional, older population appears to represent returning students; those who have gained a bit of life experience and are seeking to improve income through education. This nontraditional student is often found in community college populations. As well, advertisements for online programs or course focus on older or working adults. The mantra of "anytime, anywhere" or "ready when you are" education has become almost an advertising chorus for college online programs in both private and public institutions. Profiles similar to this were also reported in other studies (MacGregor, 2000; Richards, 1992, 1995) and are typical of nontraditional student populations. Marketing success for online courses and programs may account for the demographic profile that this study uncovered rather than be a product of the online environment alone. This study did not focus on the issue of marketing as an influence on who does and does not take an online course, future research should examine the relationship of marketing, enrollment in online classes, and the success of the marketed populations in the online courses.

MacGregor (2000), one of the few studies to examine personality as a factor in online courses to date, found that online students were more likely to take an online class

again in spite of a perception of higher workload for an online course, lower anticipated grades, and lower comfort. In this study, retention rates for online students were remarkably high ($n = 464$, 94%) in spite of there being no statistically significant influence from personality. Ethnicity was found to be a factor in retention with Hispanic and Asian students being less likely to be retained than expected. This finding may be attributed to communication and cultural differences wherein the impersonal nature of online education is too divergent of a means of communication. This finding may also be attributed to cultural differences between instructor and student. And finally this remarkably high retention rate may be a result of the low/no interaction design or the equally disproportionate grade inflation associated with Olympic College online courses. More specifically future research could be conducted to determine which, if any, of the factors is cause for such high retention rates, but the value of that research would need to be weighed against a faculty body and administration that is not self-policing.

Temperament Findings

In this study personality was found to be an influencing factor in online student success with ESTP, ISTP, INTJ, and ESTJ more likely than all other temperaments to be successful based upon final course grade. ESTP and ISTP both fall within Keirsey's Artisan category for temperament, INTJ in Rational, and ESTJ in Guardian. While Guardians represented strongly among students taking an online course, they did not represent as strongly among successful students. Conversely, Artisan and Rational categories were poorly represented among all online students demographically yet represented among the top four temperaments for success in online courses. It is impossible to ascertain the influence that course design has on this result as that is outside of this study. Whereas each temperament group have different learning style preferences,

the course design may not have as much influence as anecdotal-based arguments among instructional designers may infer. Further research into this aspect and phenomenon is warranted.

Personality was also found to be an influencing factor in online student retention measured as a student taking more than one online course in a three-term period. There were more than the expected number of students with typologies of INFP and INFJ retained than all others. Again, while Guardians are the predominant temperament in society overall and were strongly represented in this study among online students, they did not represent among retained students. Idealists, while comprising only 20% of the general population, comprised the temperaments most likely to be retained.

Among the temperament elements, Feeling/Thinking was found to have an influencing effect on student success. Thinking appears to be positively correlated to online student success while Feeling is negatively correlated. Given the general design of most of the online courses at Olympic College as low-to-no interaction between students and instructors, the interaction needed among Feeling individuals to process experience is missing. It is not ascertainable as to the degree course conduct and design influenced the result in this study as mentioned already. One study Pocius (1991) reviewed that used the MBTI for characterizing students concluded that Thinkers (T) had a more positive attitude toward CAI than Feelers (F). Further research would be needed to clarify this relationship.

Temperaments in Success and Retention

As has already been noted in Chapter 2, there is little research specifically connecting or attempting to connect temperament with online student success and retention. As a result, this study inadvertently adds much more to our current

understanding of who successful and retained students are beyond the demographic profiles of marketing. Also as a result of the deficiency in research in this niche, connections and relevance of this study's findings must be inferred from related studies.

This study determined that Keirsey's Artisans (ESTP and ISTP) more likely to succeed than any other temperament group followed by one of the temperaments in Rationals (INTJ) and one of the temperaments in Guardians (ESTJ). Artisans (ST) are noted within Keirsey's work as "Concrete Utilitarians" and comparable to Myer's "SP" category (Keirsey, 1998). This supports Meunier's (1996) earlier findings that Intuitive/Feeling (NF), and Intuitive/Thinking (NT) types learned significantly more in the CAI environment the Sensing/Feeling (SF) or Sensing/Thinking (ST) types. However, Meunier's focused use of NF, NT, SF, and ST personality categorizations makes comparison of these results to other studies difficult. Still, his findings lend further credibility to the rationale of a potential difference between successful online students and the general population.

As a general category, Artisans are not bound by established rules and regulations imposed from outside themselves. As a group, Artisans see utility in achieving a proper and just end to their actions, even if this means going outside the established rules. Like most Artisans, ESTP enjoy engaging with people, but only with people for whom the ESTP sees a purpose or a benefit in engaging with. The ESTP student is noted for their hard-nosed utilitarian perspective on life and school and for seeing the end justifying the means. As workers or leaders, ESTP students could also be characterized as making the best "hired gun administrators" (Keirsey, 1998) later because they see the purpose in their actions and are not encumbered with emotional fallout from them. They are a high energy temperament whose most famous members (Andrew Jackson, Theodore Roosevelt,

Franklin D. Roosevelt, John F. Kennedy, Lyndon B. Johnson) were known for high energy and a no-nonsense approach to achieving. Keirsey notes that ESTP make up about 10% of the general population, but are more strongly represented among industrialists, criminal defense attorneys, and entrepreneurs. Boredom and detail are the greatest enemies to the ESTP.

Like other Artisans, the ISTP is a hard-nosed utilitarian who sees utility in achieving a proper and just end to their actions, even if this means going outside the established rules. This study found the ISTP to be the second most likely to succeed in an online course. Like other Artisans, the ISTP engages with people for whom they see utility, but unlike the ESTP the ISTP does not derive energy from these interactions. Under normal school conditions, instructors and administrators will misread the ISTP focus on concrete utility as either a learning or behavioural problem. The ISTP in the classroom, or under any authority that values and perpetuates rigid or blind adherence to rules and regulations, will be fiercely insubordinate. Freedom to do order their life as they see fit is the cornerstone of the ISTP. In an academic environment, the ISTP has little interest in developing verbal skills; for the ISTP it is actions over words and very little if any patience with bookwork. Lectures and sitting quietly in obedience are the greatest fears and enemies of the ISTP.

The INTJ, the third most likely to succeed in an online course according to this study's findings, are part of Keirsey's Rationals, specifically referred to as Masterminds. Where Artisans as a group value being excited, Rationals as a group value being calm; where Artisans trust impulse, Rationals trust reason; where Artisans yearn for impact, Rationals yearn for achievement; where Artisans seek stimulation, Rationals seek knowledge; and where Artisans prize generosity, Rationals prize deference. Like most

Rationals, INTJ is an abstract thinker focusing on what is possible, but utilitarian and rule abiding in achieving this goal. INTJ will work within the system to bring about change, changing the system as they go. INTJ is pragmatic in this regard. By nature, INTJ like schedules and are schedule minded by nature, ordering their active lives by the Biblical paradigm of there being a time for everything. In school and academic settings, just like in life, INTJ is an achiever. They will regularly and without consideration of the alternative, be the valedictorian, star athlete, or voted most likely to succeed. In spite of all of this, they are deeply emotional and fiercely loyal to friends and loved ones making them a solidifier in any group. INTJ is rare within the general population, comprising only 1%.

Keirsey's Guardians, of which ESTJ (10% of the general population) is categorized in, are the concrete cooperatives of the four major temperament groups. Guardians make up the largest part of American society overall. Guardians are, as Keirsey's category name implies, the pragmatic, rule abiding, tradition upholding, cooperation seekers. The prevailing value of Guardians is concern. Whereas Rationals trust reason and Artisans trust impulse in interpreting the world, Guardians trust authority. They yearn to belong and seek security, while prizing gratitude. As "The Supervisors", ESTJ students naturally gravitate to the role of doing what authority says needs to be done and doing so with trust in that authority. More so, ESTJ feels at home with insuring others do the same. The ESTJ student is good at ordering their life and their school work, following procedures correctly, and trusting the instructor without question.

As to success in an online course, INTJs explicably as high achievers are expected to rank among the students most likely to succeed as they would viably on any success list. However, based upon the descriptors of an ESTP, ISTP and ESTJ, these unlikely

candidates for online success never the less succeeded and were more likely to succeed than other temperaments in the sample. While conjecture and more research is necessary, the unexpected homogeneity encountered in this sample could explain the reasons for success.

The overwhelming abundance of low-to-no instructor-to-student contact and little-to-no community building within the courses by the instructors in Olympic College's online courses, ESTP and ISTP temperaments could find it appealing. As already mentioned, Artisans in general are rueful of structure and of interactions that they do not find productive. Whereas traditional classroom structure and pacing are counter to Artisan preferences, the lack of interaction with instructors (authority figures) and fellow students may translate to the ability for Artisans to avoid unwanted contacts. The general self-paced, independent study that comes from a noncollaborative learning environment may further appeal to the nonstructured values of the ESTP and ISTP. Additionally, due to the inherent organization necessary for any online course, its ordered organization and deadlines for assignments and examinations would appeal to the ESTJ Guardians.

Worth noting, and while somewhat dated by technology, hindered by narrowness, and inconsistent with other studies, Suddendorf's (1986) doctoral dissertation using MBTI and CAI with students in a medical technology program found that extraverted (E), sensing (S), feeling (F) and judging (J) types showed a more positive attitude and propensity toward the CAI format than other groups. These results run somewhat counter to the findings of this study. However, as was noted earlier, there has been questions (MacGregor, 2000) on the sample and the narrowness of Suddenhof's study.

Demographically, the successful online student in this study mirrors earlier research of the general online student (Blocher, 1997; MacGregor, 2000, 2002; Pocius,

1991; Richards, 1992, 1995). Pocius (1991) and Richards (1992, 1995) found that online students tended to be female, older and employed full time. MacGregor (2000, 2002) found that successful online students were less lively, less open to change, and less socially bold than successful students in face-to-face classrooms. Additionally she found them to be more worrisome, serious, shy and accepting of the status quo. This finding runs counter to the nature of Keirsey's Artisans but runs in alignment with the ESTJ profile. While more research is needed to further validate the generalizability of these findings, there is similarity.

The successful online student is not the same temperament as the retained online student. Again, retained for this study is defined as any student who has taken an online course in two of three terms. This specifically targets those who are going to stay with online courses as a choice over other forms of delivery. In this study, Keirsey's Idealists (INFJ and INFP) were the two most likely in that order to return to online courses.

INFJ and INFP are part of Keirsey's Idealist temperament category. While there are subtle variations between the Idealists, in general they are all Abstract Cooperatives. Idealists talk and process the world in the abstract—in ideas. Idealists see the world as an ethical, honorable place and process their perspectives on the world from that starting point. As cooperatives, Keirsey's Idealists seek to bring unity and connection between people and to build cooperative unions to achieve their end goals. Whereas Rationals value calm, Guardians value concern, and Artisans value excitement, Idealists value enthusiasm. Whereas Rationals trust reason, Guardians trust authority, and Artisans trust impulse in interpreting the world, Idealists trust intuition. Idealists yearn for the romantic whether it is in their personal life or in their perspective of the world. They are introspective and reflective, always seeking their own identity and understanding that

identity. And whereas Rationals prize deference, Guardians gratitude and Artisans Generosity, Idealists prize recognition.

INFJ, what Keirsey calls “the Counselors”, are the most likely to be retained of the temperaments. Like most Idealists, INFJ have a strong internal calling to help people realize their potential. Although INFJ is people focused, INFJ is generally considered hard to get to know. Their reserved nature and their general desire to remain private make them appear to most as either aloft or arrogant, which is far from the real INFJ. Because they are Idealists, the INFJ has a strong sense of connection with people, even to the point of feeling the other person’s unspoken internal turmoil. This is both a curse and a blessing as it connects the INFJ with people, but it becomes taxing on them and pushes them away from people. Therefore, by choice, the INFJ will limit contact with people to preserve their own well-being. As students, they are generally high achievers and excel in the professional studies more often than the scholastic.

Similar in many ways to the INFJ, the INFP, what Keirsey calls “the Healers”, are the rarest of the Idealists. Constituting less than 1% of the total general population, INFP has a profound sense of Idealism. Like other Idealists, INFP see the world as an ethical and honorable place, but they often face difficulty reconciling with they know internally to be true and what they see around them in the physical world. INFP often report abusive childhoods with siblings or parents who attempt to break the idealist perspective of the INFP child. This sets up a life-time quest with the INFP that is one of the temperament’s hallmarks, seeking one’s place in the world and rectifying what they know to be real and what they have been told is real. INFP is more future-focused than other temperaments, which makes them more often the futurologists of society and technology. They are, like INFJ, private and reserved as a means of self-preservation, in

spite of their innate ability to feel and experience the pain and emotions of others even when others are unable to articulate those feelings. As students, INFP tend to do well with humanity and professional studies. In most cases, INFP do not come into their scholastic selves until college as most report a preference for college over high school.

While not tested for in this study, and given the study's already listed limitations, we may be able to hypothesize that INFJ and INFP are more often retained as a function of their desire for human contact with their need for private time. Human contact is taxing on the INFJ and INFP as both of these temperaments feel the emotions and internalize the feelings of others innately. This tax on their emotions becomes draining making the INFJ and INFP seek solitude from other people. Online courses allow for this dichotomous condition in education.

Implications for Distance Learning

Rather than approach the design side of online education as a way to improve online student success and retention, specifically attempting to educate faculty away from their habitual teaching methods and into known paradigms that work in online environments, which has not been especially fruitful for most instructional designers, tools and algorithms can assist college and university advisors to suggest courses and instructors whose design and delivery online better fit the needs of the student based upon demographic and temperament.

While demographically it appears that online program marketers are being successful with attracting the nontraditional working mother with a Guardian temperament as a student, the results of this study indicate that these students may not be the best suited for success in the online environments designed with low student-instructor interaction. Several online course designers (Hanna et al., 2000; Palloff &

Pratt, 1999; Wonacott, 2000) have argued that online courses are best designed for high student-to-student and student-to-instructor interaction. Through dialectic inquiry knowledge is constructed. Establishing safe havens and true communities of learners (Lave & Wenger, 1991) online maximizes student learning overall. Conversely, the traditional industrial-age model of instructor-centric education sets up a false weeding out process that rewards only those students who best learn in this type of scenario and does not recognize the greater range of intelligences or learning styles. While among the four Keirsey categories of temperament there are none for the combined traits of Sensing and Thinking (ST), this combination of attributes appears to be connected to successful online students in courses designed with linear progression and low interaction. However, such designs exclude the remaining 75% of temperaments in the learning process. This supermajority of excluded students mandates a different, more inclusive model for online course design from that encountered in this study.

Another way to approach online education would be to enroll student temperament types into sections that are specifically designed for each, or by default of the instructor's inherent design matches one of the four temperament categories. Advising students into particular sections of courses or to take courses with particular instructors is already a fundamental part of academic advising at two and four year institutions. Arming advisors with the student's temperament information, a simple addition to matriculation screening, and specifying particular sections of the same course as being more strongly designed for specific temperaments and/or learning styles would allow for the "Amazon.com"-itization of advising. Just as Amazon.com offers suggestions to consumers based upon algorithmic preferences and past customer behaviours ("Customers who order this also ordered..."), institutions can suggest

preferences to particular sections of courses or to particular instructors based upon temperament and learning style preferences of the students and teaching style and course designs of instructors. While small, this type of advising is technologically possible and economically feasible in most institutions. Its potential to help students realize a more rewarding educational experience is apparent without requiring faculty to alter their teaching styles but instead having those styles accounted for, addressed and designed for in their courses.

Conclusion

With the advent of the World Wide Web and an almost universal e-mail access for middle-class citizens in the industrialized states, educators and administrators have begun to examine or embrace this accessibility phenomenon to increase the learning experience or to reach out to new students. Studies of distance education repeatedly indicate that students participating in distance education courses of all types are more likely to drop out or not complete the course. Given the high cost of recruiting students compared to the cost of retaining a recruited student and policy makers and public calls for greater accountability by higher education institutions of student success in light of the escalating cost of a college degree, college and university administrators are not only interested in the prospect of luring students to campuses virtually from anywhere and overcoming the limitations of geographic bound campuses and its associated housing, feeding, etc., but also interested in the factors needed to assist these students in being more successful and retained on the institution's rosters. Temperament is an element that lends itself to better addressing these concerns. Through a marrying of the student's temperament preferences with the customization of course delivery and methodology that the online environment offers, higher education may realize a fuller experience, greater

knowledge construction, lower operating costs for recruitment, and greater student outcomes, thus reversing the online drop-out rates, in online distance education.

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APPENDIX A

Initial Participant E-Mail

Dear Former Olympic College Online Student:

My name is Ben P. Meredith, and I am a doctoral student in Educational Technology at Pepperdine University, Graduate School of Education and Psychology, who is currently in the process of recruiting individuals for my study entitled, "Personality Types as an Indicator of Online Student Success and Retention." Dr. Farzin Madjidi is my supervising chair. The study is designed to investigate if personality type has an influence on the success and retention of online students, so I am inviting individuals who are over 18 and have enrolled in an online course at Olympic College to participate in my study. Please understand that your participation in my study is strictly voluntary. The following is a description of what your study participation entails, the terms for participating in the study, and a discussion of your rights as a study participant. Please read this information carefully before deciding whether or not you wish to participate.

If you should decide to participate in the study, you will be asked to complete the online version of the Keirsey Temperament Sorter II and allow me to include your grades for the online courses you enrolled in for analysis. All information is collective and there will be no identification of you individually in any way. It should take approximately 15 minutes to complete the survey you have been asked to complete and you can do this completely online.

Although there are no known risks that you should consider before deciding to participate in this study. No individual test results will be released in any way. There will be no way for you to know what your results are. There are also no right or wrong

answers. The test consists of 70 statements with two possible answers. You will be asked to select the answer that best fits your preference for answering in each case. In the event you do any confusion as a result of this test, you may stop at any time.

Your participation in this study will help us understand better how to improve online courses, understand who is taking online courses, and if there is a connection between personality type and online student success and retention that we can then use to better your online education experience.

If you should decide to participate and find you are not interested in completing the survey in its entirety, you have the right to discontinue at any point without being questioned about your decision. You also do not have to answer any of the questions on the survey that you prefer not to answer—just leave such items blank.

After 2 weeks, I will email a reminder note will be sent to you to complete the survey. This note will only go out to those who have not completed the survey. If you still decide to not participate or you are not interested in completing the survey in its entirety, you have the right to discontinue at any point without being questioned about your decision.

When the findings of the study are presented to professional audiences and published, no information that identifies you personally will be released. The data will be kept in a secure manner for at least two years at which time the data will be destroyed.

If you have any questions regarding the information that I have provided above, please do not hesitate to contact me at the email address and phone number provided below. If you have further questions or do not feel I have adequately addressed your concerns, please contact Dr. Farzin Madjidi of Pepperdine University at Farzin.Madjidi@pepperdine.edu. If you have questions about your rights as a research

participant, contact Stephanie Woo, Chairperson of the Graduate and Professional School, Pepperdine University, (310) 568-5753.

By completing this online survey, you are acknowledging that you have read and understand what your study participation entails, and are consenting to participate in the study.

Thank you for taking the time to read this information, and I hope you decide to complete the survey. You are welcome to a brief summary of the study findings in about 1 year. If you decide you are interested in receiving the summary, please contact me at the address below.

Sincerely,

Ben P. Meredith
Doctoral Candidate

APPENDIX B

Participant Consent Form

This study researches the possible connection between personality type and online student success and retention. This study is planned to include 600 former online students.

The participants will participate in a 70 question Keirsey Temperament Sorter II survey that will take approximately 15 minutes to complete. In each of the 70 questions within the Keirsey Temperament Sorter II survey, participants will be asked to make a preference selection from two presented options. This will be done through a web-site and all information obtained through this survey will be handled collectively in its reporting. Participant's online course grades will be accessed for purposes of this research. No individual grades or academic information will ever be reported.

There is little to no risk of real or perceived mental or psychological threat to the participants from this survey. There is no physical threat to the participants at any time as a result of this research.

Your participation in this study will help us understand better how to improve online courses, understand who is taking online courses, and if there is a connection between personality type and online student success and retention that we can then use to better your online education experience.

All information regarding which student did or did not participate in the study and all information that might identify participants in the study or/and connect them with the information gathered by the researcher will not be shared with the institution's instructors, administration or staff. No names will be used in regard to this research. The

researcher alone will keep the master list of participants. This master list will be stored in a separate, secure location from all other data.

If you have any questions regarding this information that, please contact the researcher at (email) or (phone number). If you have further questions or do not feel I have adequately addressed your concerns, please contact Dr. FarzinMadjidi of Pepperdine University at Farzin.Madjidi@pepperdine.edu. If you have questions about your rights as a research participant, contact Stephanie Woo, Chairperson of the Graduate and Professional School, Pepperdine University, (310) 568-5753.

Your participation in my study is strictly voluntary. You may stop participation at any time and no further request or contact will be made toward you. There are no consequences for your participation or withdrawal from participation in this study. No administrator, staff or faculty member of Olympic College will ever be notified or made aware of your decision to participate or not participate in this study.

This text will be located in a scrollable web-dialogue box in the Zoomerang survey software. First participants must scroll through the entire text, then participants MUST select either “I agree” or “I do not agree”. Selecting “I agree” allows the participants to take the survey. Selecting “I do not agree” redirects the participants to a “Thank you” page and out of the survey.

APPENDIX C**Keirsey Temperament Sorter Survey Questions**

Instructions: In a quiet room, alone if possible, with no distractions, read each item and decide whether (a) or (b) more closely reflects you and mark the item accordingly. There is no right or wrong answer since about half of the world's population agrees with your answer.

1. When the phone rings

O (a) hurry to get it first O (b) hope someone else will answer

2. Are you more

O (a) observant than introspective O (b) introspective than observant

3. Is it worse to

O (a) have your head in the clouds O (b) be in a rut

4. With people are you usually more

O (a) firm than gentle O (b) gentle than firm

5. Are you more comfortable making

O (a) critical judgments O (b) value judgments

6. Is clutter in the workplace something you

O (a) take time to straighten up O (b) tolerate pretty well

7. Is it your way to

O (a) make up your mind quickly O (b) pick and choose at some length

8. Waiting in line, do you often

O (a) chat with others O (b) stick to business

9. Are you more

O (a) sensible than ideational O (b) ideational than sensible

10. Are you more interested in

O (a) what is actual O (b) what is possible

11. In making up your mind are you more likely to go by

O (a) data O (b) desires

12. In sizing up others do you tend to be

O (a) objective and personal O (b) friendly and personal

13. Do you prefer contracts to be

O (a) signed, sealed, and delivered O (b) settled on a handshake

14. Are you more satisfied having

O (a) a finished product O (b) work in progress

15. At a party, do you

O (a) interact with many, even strangers O (b) interact with a few friends

16. Do you tend to be more

O (a) factual than speculative O (b) speculative than factual

17. Do you like writers who

O (a) say what they mean O (b) use metaphors and symbolism

18. Which appeals to you more:

O (a) consistency of thought O (b) harmonious relationships

19. If you must disappoint someone, are you usually

O (a) frank and straightforward O (b) warm and considerate

20. On the job, do you want your activities

O (a) scheduled O (b) unscheduled

21. Do you more prefer

O (a) final, unalterable statements O (b) tentative preliminary statements

22. Does interacting with strangers

O (a) energize you O (b) tax your reserves

23. Facts

O (a) speak for themselves O (b) illustrate principles

24. Do you find visionaries and theorists

O (a) somewhat annoying O (b) rather fascinating

25. In a heated discussion, do you

O (a) stick to your guns O (b) look for common ground

26. Is it better to be

O (a) just O (b) merciful

27. At work, is it more natural for you to

O (a) point out mistakes O (b) try to please others

28. Are you more comfortable

O (a) after a decision O (b) before a decision

29. Do you tend to

O (a) say right out what's on your mind O (b) keep your ears open

30. Common sense is

O (a) usually reliable O (b) frequently questionable

31. Children often do not

O (a) make themselves useful enough O (b) exercise their fantasy enough

32. When in charge of others do you tend to be

O (a) firm and unbending O (b) forgiving and lenient

33. Are you more often

O (a) a cool-headed person O (b) a warm-hearted person

34. Are you prone to

O (a) nailing things down O (b) exploring possibilities

35. In most situations, are you more

O (a) deliberate than spontaneous O (b) spontaneous than deliberate

36. Do you think of yourself as

O (a) an outgoing person O (b) a private person

37. Are you more frequently

O (a) a practical sort of person O (b) a fanciful sort of person

38. Do you speak more in

O (a) particulars than generalities O (b) generalities than particulars

39. Which is more of a compliment:

O (a) "There's a logical person" O (b) "There's a sentimental person"

40. Which rules you more

O (a) your thoughts O (b) your feelings

41. When finishing a job, do you like to

O (a) tie up all the loose ends O (b) move on to something else

42. Do you prefer to work

O (a) to deadlines O (b) just whenever

43. Are you the kind of person who

O (a) is rather talkative O (b) doesn't miss much

44. Are you inclined to take what is said

O (a) more literally O (b) more figuratively

45. Do you more often see

O (a) what's right in front of you O (b) what can only be imagined

46. Is it worse to be

O (a) a softy O (b) hard-nosed

47. In trying circumstances, are you sometimes

O (a) too unsympathetic O (b) too sympathetic

48. Do you tend to choose

O (a) rather carefully O (b) somewhat impulsively

49. Are you inclined to be more

O (a) hurried than leisurely O (b) leisurely than hurried

50. At work do you tend to

O (a) be sociable with your colleagues O (b) keep more to yourself

51. Are you more likely to trust

O (a) your experiences O (b) your conceptions

52. Are you more inclined to feel

O (a) down to earth O (b) somewhat removed

53. Do you think of yourself as a

O (a) tough-minded person O (b) tender-hearted person

54. Do you value in yourself more that you are

O (a) reasonable O (b) devoted

55. Do you usually want things

O (a) settled and decided O (b) just penciled in

56. Would you say you are more

O (a) serious and determined O (b) easy going

57. Do you consider yourself

O (a) a good conversationalist O (b) a good listener

58. Do you prize in yourself

O (a) a strong hold on reality O (b) a vivid imagination

59. Are you drawn more to

O (a) fundamentals O (b) overtones

60. Which seems the greater fault:

O (a) to be too compassionate O (b) to be too dispassionate

61. Are you swayed more by

O (a) convincing evidence O (b) a touching appeal

62. Do you feel better about

O (a) coming to closure O (b) keeping your options open

63. Is it preferable mostly to

O (a) make sure things are arranged O (b) just let things happen naturally

64. Are you inclined to be

O (a) easy to approach O (b) somewhat reserved

65. In stories do you prefer

O (a) action and adventure O (b) fantasy and heroism

66. Is it easier for you to

O (a) put others to good use O (b) identify with others

67. Which do you wish more for yourself:

O (a) strength of will O (b) strength of emotion

68. Do you see yourself basically

O (a) thick-skinned O (b) thin-skinned

69. Do you tend to notice

O (a) disorderliness O (b) opportunities for change

70. Are you more

O (a) routinized than whimsical O (b) whimsical than routinized