

ABSTRACT

AN EXPLORATION OF STUDENT PERSONALITY TYPE AND SUCCESS IN ONLINE CLASSES

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Strategies that have worked to offset high attrition rates and retain students in traditional institutions of higher education are not necessarily applicable within an online learning environment. As a result, not only is student attrition more likely to occur in the online environment, but traditional classroom retention strategies are less likely to be effective. The shortcomings in predicting student success in online learning suggests that the methods used to assess student performance have been inadequate. Research in both traditional and online education has shown that students with specific personality types may be more likely to excel within the classroom. Therefore, this study explored students' personality types in relation to online course success in order to isolate personality types that may be more likely to succeed in an online learning environment. A comparative case study was used to compare a sample of community college business students who have been successful in online learning environments and those who have not been successful. This study uses the classical DISC survey instrument in conjunction with one-on-one interviews. The findings indicate that personality type cannot be used to predict online course success. Results suggest that student characteristic behaviors,

rather than simply personality type, although likely related, may be more relevant to community-college student success in an online learning environment. In addition, findings from the study reveal the potential benefits that student technology can provide, including support for students new to online learning and increased levels of collaborative learning and communication. These particular elements could be implemented as part of the required curriculum for online courses. It is recommended that educational leadership potentially use these results to support improvement in student success in an online environment.

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DEDICATION

The dissertation is dedicated to the memory of my mother, my father, my wife and children, and to all of my sisters and brothers, especially my sister Dee

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CHAPTER 1

INTRODUCTION

Although distance learning has been a part of postsecondary education since the 1940s, the popularity and prevalence of online learning began in the mid-1990s (Mondale, 2002). At that time, distance learning institutions made the transition to the online environment and demonstrated to traditional learning institutions that the model was not only viable, but profitable (Ahern & Repman, 1994; Mondale, 2002). Historically, distance learning had been perceived as less desirable than on-site education due to resource accessibility limitations such as direct communication with the professor and the ability to use learning materials located on campus (NCES, 2001).

The emergence of high-speed Internet facilitated a digital environment in which these traits could be integrated into the distance-learning model. Since that time, online learning has not only become more popular but has been recognized as a preferred delivery system to traditional on-site education for many students. A recent national survey from the Sloan consortium reported that the majority of the faculty members in colleges and universities viewed online education as capable of providing equal or superior learning experiences compared to those from traditional classroom instruction (Allen & Seaman, 2007).

Despite the increasing popularity and prevalence of online learning, as well as the perceived quality of online education compared to traditional education, challenges

to the digital classroom have characterized much of the literature. It has been argued that online learning has many liabilities, including the lack of effective administration of students' learning, online learners' lack of technical skills, and the lack of social interaction during online learning (Muilenburg & Berge, 2001). As a result, a reciprocal effect has been created within the literature where researchers and pedagogical theorists defend distance and online learning by addressing these negative criticisms (Mariani, 2001; Muilenburg & Berge, 2001; Nistor, English, Wheeler, & Jalobeanu, 2003). This has resulted in discrepancies in the literature with regard to online and distance learning, in which data that address specific performance outcomes had generated conflicting results (Mariani, 2001).

In an effort to address the mixed results regarding the effectiveness of online instruction and identify why these discrepancies exist, many past research studies have sought to examine which institutional and learner factors influence the overall quality of online learning programs. However, few efforts have been made toward determining what the mediating variables or mechanisms at the course level may be or what impact these may have upon the student learner. Isolation of these variables may provide resolution of these discrepancies in the literature and can provide recommendations for effective online learning strategies.

Statement of the Problem

The goals and objectives of students who attend postsecondary education are to successfully complete their courses and to achieve their desired degree by graduating.

Retention has been one of the major problems faced by colleges and universities, which are striving to improve student retention rates (Adelman, Chen, & Horn, 1998; Roach, 2000). Many obstacles face students while attending colleges and universities, and historically there has been a high rate of student attrition prior to completion of the degree (Adelman et al., 1998). Prior to attrition, the majority of these unsuccessful students drop one or more of their problematic or difficult courses, which indicates that the drop rate of courses may be a marker for students suffering from academic distress (Adelman et al., 1998).

While traditional postsecondary institutions recognize attrition as a serious problem and have worked to promote student retention through a myriad of intervention strategies, these problems are amplified within online institutions of higher learning. Moreover, strategies that have worked to retain students in traditional educational institutions are not applicable to the online institution, as these have focused on community building and integrating the student into on-campus assistance programs (Nistor et al., 2003). As a result, not only is student attrition more likely to occur in the online environment, but retention strategies are less likely to be effective. In addition, confusion in the literature concerning how students interact within the online classroom limits the development and application of strategies that may effectively reduce attrition and promote retention in the online educational setting (Guernsey, 1998; Mariani, 2001; Muilenburg & Berge, 2001; Nistor et al., 2003).

Purpose of the Study

The student populations who participate in online learning are of interest to researchers and educators. The demographic data associated with students who participate in online learning suggests that certain student populations are more likely to seek out and participate in online learning. The student who participates in online learning is likely to be older than the traditional student, tends to have family and professional obligations, and is more racially diverse than students who attend on-campus learning at traditional postsecondary institutions (Allen & Seaman, 2007; Mondale, 2002; Nistor et al., 2003). Research suggests that students who fit into these categories have been found to benefit from the online classroom structure; working adult professionals who seek to obtain a degree are foremost on this list, as online learning may better fit their lifestyles than traditional structured classroom routines (Allen & Seaman, 2007).

Research in both traditional and online education has shown that students with specific personality types are more likely to excel within the classroom (Taher, Chen, & Yao, 2011). This has led to research in psychometric profiling for both business and education, in which personality type is seen as an indicator of retention for participants in the organizational culture established by the institution (Reynierse, Ackerman, Fink, & Harker, 2000). It is theorized that personality type can mesh with the demands of the organization and improve the person's willingness to stay committed to that organization (Bamber & Castka, 2006; Bjorseth, 2004; Reynierse et al., 2000). It is possible that similar personality profiling can be done in respect to the online classroom

to test whether retention can be improved through identifying which personalities thrive within the online educational environment and how the qualities of this classroom can be altered to provide beneficial outcomes for other personality types.

The DISC model was introduced by William Moulton Marston in 1928 to provide an overview of personality types that could be understood by the layperson. The DISC model provides insight into the four domains (dominance, influence, submission, and compliance), or components, of personality that Marston had identified in all personalities. Bjorseth (2004) interpreted these four domains as “the four types of responses people have to their environment” and “how a given person cultivates relationships with others” (p. 1). One of Marston’s motivations for developing the DISC model was to make psychometrics, or personality profiling, available outside of the field of psychology and mental health. Although there are more complex psychometrics inventories that allow for greater depth of analysis, the DISC model allows for a convenient analysis of an individual’s personality that can be easily understood by those without a background in psychology.

The purpose of this study was to explore student personality types using the DISC model of personality assessment and to isolate which personality types are most likely to succeed in an online academic institution. The DISC model is based on William Marston’s theory of personality type and has been independently validated as a viable tool in identifying personality traits. The setting for this study was the business department of a community college in northern Illinois. This setting was selected as the study site because it is local to the researcher, and the institution places a strong focus on its online learning department.

Significance of the Study

The current literature with regard to online learning and distance education demonstrates that the characteristics of student populations may play a role in their successful completion of educational goals (Guernsey, 1998; Mariani, 2001). These characteristics have thus far corresponded to demographic information such as the age of the student or whether the student is employed as a full-time professional in addition to his or her academic pursuits (Nistor et al., 2003). These characteristics have also been used to predict student success within the online environment, where the student's profile is seen as a component of whether or not that student will be able to successfully engage the learning process in a digital curriculum. However, there are still persistent retention issues for students who participate in online learning, even among student populations who are seen as likely to succeed. The shortcomings in predicting student success in online learning suggest that the methods used to assess student performance are inadequate.

Online educational institutions would benefit from reliable predictions based upon student criteria. Access to data describing which students are more likely to experience difficulties within the academic setting would ensure that strategies designed to promote retention could be implemented and demonstrate effectiveness. Also, predictive information would help in areas such as future planning, budgeting, counseling, admissions, and marketing; students would benefit from reliable predictive methods, which could help facilitate decisions made with regard to coursework and areas of their academic studies in need of focus and ongoing enhancement.

The study explored the value of *personality type* as a predictor variable for student learning and success in online courses. It sought to identify different techniques to be used by instructional technologists to design instructions based on personality types and to suggest ways to improve student success in an online environment. Because student success predictor variables are also directly related to retention, the results could facilitate the inception of strategies designed to retain those students who may leave the online university. In addition, because student success and retention play a key role in the institution's reputation and profitability, improved retention strategies would facilitate positive long-term planning and progress for all participants.

Rationale of the Study

This study sought to test whether personality type is a predictor of attrition or retention, and if it is a predictor of attrition or retention, to draw recommendations from the correlated personality types that can be applied to improve retention for other students who have personalities that are less likely to remain active within an online education environment. The rationale for this study comes from similar research done within the traditional educational setting in which personality type has been linked to student performance and student attitudes towards the school. The research has also linked student performance to the demographic criteria met by specific student populations within the online environment. These themes strongly suggest that similar links may be made when a student with a specific personality type is addressed in respect to his or her performance in the online academic setting.

Research Questions

The study's goal was to answer the following research questions:

1. Is there a relationship between a community-college student's personality type and his or her success in online courses?
2. How does a community-college student's personality type support his or her online learning experience?

Scope of the Study

This study sought to identify three core themes: First, personality type and its relationship to student performance needs that would need to be isolated; second, personality type and its relationship to online academic performance needs that would need to be isolated; and third, retention strategies used to target specific student populations that would need to be clarified. The first two themes were drawn from the literature and from data collected during this study, which employed a comparative case study using both quantitative and qualitative data collection techniques. This comparative case study compared learners that are successful in online learning environments with those that are not successful using multiple methods: the classical DISC instrument and a Likert-type survey in conjunction with one-on-one interviews. The DISC instruments were distributed to 50 online business students at a community college in northern Illinois, 25 of whom have successfully completed at least three online classes and the other 25 representing those who attempted to take two or more

online classes and have failed through low grades, attrition, or failing to meet other benchmarks that denote success as described by the teacher or the college.

The second part of the study was conducted through semi-structured one-on-one interviews with students from both groups. The semi-structured interviews were guided by questions derived from the literature on online learning and literature on student needs. Each interview took 20 to 30 minutes to complete. The themes revealed through analysis were identified and delineated based upon the literature collected from external sources.

Before this study's research methodology is defined and described in Chapter 3, the literature review process will be described. The literature review process involved significant archival retrieval from physical libraries as well as from relevant online sources. Whenever possible, peer-reviewed academic journals were used as the foundation for the thematic review, and these were validated through evidence collected from articles, books on pedagogical theory, and other sources relevant to the topic or the theme at hand. The selection of literature focused on the topics of online learning, student retention and attrition in online learning, and psychometric testing with respect to candidate selection.

When possible, peer-reviewed data was selected and used in the literature review. The data was collected via the Northern Illinois University's electronic search and retrieval services. When an article or an author was proven especially helpful in the research or in the writing process, additional information that was written by the author or was presented in the reference list of the source was retrieved and screened for appropriateness of use in the current study.

Definition of Terms

The following terms were used in this study:

DISC Model: Based on the work of William Moulton Marston, Ph.D. (1893 - 1947), DISC is a four-quadrant behavioral model that isolates the behavior of individuals in their environment or within a specific situation. DISC looks at behavioral styles and behavioral preferences. DISC is an acronym for *Dominance*, *Influence*, *Steadiness*, and *Conscientiousness*; these terms are also defined in this section.

Dominance: A quality of personalities that relates to control, power, and assertiveness.

Influence: A quality of personalities that relates to social situations and communication.

Steadiness (also referred to as Submission): A quality of personalities that relates to patience, persistence, and thoughtfulness.

Conscientiousness (also referred to as Caution or Compliance): A quality of personalities that relates to structure and organization.

Online learning: An online course is a class where the educational material is presented through the use of various communication technologies including but not limited to a class Web site, e-mail, list serves, and computer multimedia, and has the same course outline of record, course number, course title, and credit hours as an equivalent on-campus class (Diaz, 2002).

Self-efficacy: The motivation that is derived from a student's own personal motivation to succeed.

Success: The attainment of goals or the achievement of specific benchmarks.

These can be determined either by the student or by others (e.g., teachers designating grades of A, B, C, etc.).

Assumptions, Limitations, and Delimitations

This study took several assumptions and delimitations into account, as well as several key limitations. In terms of assumptions, the following criteria were assumed:

- Respondents were able to accurately report their personal information regarding their personality types and their experiences.
- Respondents were able to provide information that fits into the parameters of the DISC model.
- Student success can be measured in terms of grades (A, B, C, etc.) in respect to courses taken online. This provides benchmarks that can be used as comparison points for the academic performance of the respondents.
- Students in online classes represent both current and future online students.
- A medium sample size ($N = 50$) was used, and this sample size provided an adequate representative sample of the students enrolled in the online classes at the college.
- Results from this study can be applied to other populations that are similar to those assessed during the sampling process and are not exclusively unique to the sample site.

The following delimitation criteria were accepted:

- The study was conducted at a community college located in northern Illinois.
- Students enrolled in the online course curricula at the business department at this college were recruited to be the participants in the sample population.
- The study took place over a three-month period, but the experiences of the sample population as online students encompassed no fewer than six months and no more than three years.

In terms of limitations, the following concerns were noted:

- The methodology sampled the self-reporting perceptions of participants. While it was assumed that the respondents reported the pertinent information as they were best able, there are no guarantees that all respondents identified the content of the questions in the same way. This indicates that while all respondents may have reported their answers as they were best able, there may still be inconsistency within the results based upon assumed consistency.
- The study may have relevance to a broad setting in respect to online studies and the online curricula, but the community college is by no means representative of all formats in which online learning takes place. This reduces the applicability of results.
- Differential selection of subjects is likely to occur in which the experimental population may manifest characteristics that are unique to their group; this is more likely to occur if the sample population is comprised exclusively of adult students who take online courses and are located in the same geographic region of the country.

Summary

The drive to promote student retention requires that colleges and universities recognize why students leave before colleges and universities can implement strategies designed to retain them. Online colleges and universities suffer from student attrition at greater rates than do traditional postsecondary institutions. Assessment of student personalities at a local community college in northern Illinois may help identify personality type in respect to academic performance in the online institution. Moreover, these processes are likely to facilitate the retention of students by indicating which students may experience problems with online learning and providing subsequent recommendations.

CHAPTER 2

REVIEW OF THE LITERATURE

Retention within postsecondary institutions is a significant issue for administrators, educators, and stakeholders of the idea of community within education (Martin, 1996; Sweet, 1986). The role of personality as a component within retention has thus far been under-studied within the literature. This chapter provides an overview of how personality types impact performance, with an emphasis on personality modeling tools such as Marston's DISC model.

Personality and Performance

In the study of personality, specific traits have been attributed to personality types (Allport, 1937; Cattell, 1943; Kummerow, Barger, & Kirby, 1997; Meisgeier, Murphy, & Meisgeier, 1989; Pervin, 1990; Rogers, 1993; Shaver, 1984). A *trait* in personality research refers to "similar responses" to internal or external stimuli, where certain persons with shared traits respond to the stimuli in a like manner ("What is Personality," 2009, para. 2). Within the study of personality and performance, these traits have likewise been associated with learning style (Meisgeier et al., 1989; Myers &

Myers, 1980; Sewall, 1986) and preferences towards group and individual participation within the classroom (Provost & Anchors, 1987).

Advocates of personality theory strongly believe that conditions in which learning occurs can facilitate outcomes if these conditions favor the personality type of the student (Rogers, 1993). Similar outcomes have been reported within organizational environments such as the workplace (Kummerow et al., 1997; Lawrence, 1979; Pervin, 1990; Rorer, 1992; Shaver, 1984; Wiggins, 1991). This has caused some researchers to suggest that structuring the classroom around the individualized personality of the student will help the student achieve specific academic goals (Meisgeier et al., 1989; Rogers, 1993).

The impact of personality within the classroom has been studied but has thus far not been quantified. Using personality type as a prediction of specific behavior is therefore an inappropriate application of personality theory (Myers & Myers, 1980; Sewall, 1986). Moreover, personality types are also thought to change throughout the individual's lifetime (Wheeler, 1983). If this is the case, then assignment of specific work-related or educational organization structures based upon the individual's current personality may reduce long-term effectiveness. These traits emphasize that modeling of personality predictions must therefore incorporate a high degree of adaptability and flexibility to existing conditions and to potential change throughout the individual's association with that organization.

The DISC Model

In 1928, sociologist William Marston introduced *The Emotions of Normal People*, a book that explored personalities by establishing set criteria and providing a framework through which the emotional state of the individual could be analyzed in comparison to these criteria (Marston, 1928). Marston “viewed people as behaving along two axes with their actions tending to be active or passive depending upon the individual's perception of the environment as either single antagonistic or favorable” (PersonalityPro.com, 2009, para. 6). This process created an axis with four definite quadrants. These quadrants had an assigned “behavioral pattern or personality type,” and if the individual taking a personality test demonstrated an emotional state that corresponded to the behavioral pattern within a specific quadrant, then it was believed that the individual corresponded with that specific personality “type” (PersonalityPro.com, para. 6). Using this system, it is possible to identify – or plot – specific criteria of a personality along either axis. When this occurs, the opposite ends of the axes “refer to two opposite traits in behavioral styles, while the axes themselves represent the different shades and moods of the trait as [the user moves] from one extreme to another” (profilesglobal.com, 2009, para. 2).

The four quadrants are identified as follows:

- *Dominance* produces activity in an antagonistic environment.
- *Influence* (originally called *Inducement*) produces activity in a favorable environment.
- *Steadiness* produces passivity in a favorable environment.

- *Conscientiousness* (also called *Compliance*) produces passivity in an antagonistic environment (PersonalityPro.com, 2009, para. 8).

These four axes provide the name of the DISC model, and the information derived refers to the use of the DISC instrument in predicting personality. The physical alignment of these axes is illustrated in Figure 1.



Figure 1: The DISC model axes alignment, retrieved from www.profilesglobal.com, 2009.

The four axes are representative of specific outcomes that occur when an individual is placed in a particular set of circumstances. The expression of a specific axis indicates that the particular axis is representative of that personality within those circumstances. To clarify, Manager-Tools.com (2009) described these four axes of the DISC model as the following:

- *Dominance*: achieves success by taking decisive actions towards their goal.

- Strengths: comfortable in a leadership role, problem solver, can make tough decisions, not afraid to confront issues, sees change as a challenge, and stays focused on the mission.
- Limitations (that others may see): intimidating, insensitive, brusque, impatient, intolerant, and unapproachable.
- *Influence*: achieves success by persuading others to work with them towards a goal.
 - Strengths: always available for others, inspiring to be around, spreads positive attitude, and praises others.
 - Limitations (that others may see): tasks fall through the cracks, projects do not get finished, and lack organization.
- *Steadiness*: Works with others as part of a team to achieve success.
 - Strengths: good team player, empathic to others' needs, methodical, good listener, easy to get along with, appreciative of others, and praises others.
 - Limitations (that others may see): indecisive, indirect, resistant to change, and sometimes worn down by others' problems.
- *Conscientious*: works within rules and procedures to ensure success.
 - Strengths: thorough, follows standards accurately, conscientious, diplomatic, accurate, and fair.
 - Limitations (that others may see): overly concerned with perfection, aloof, delays decisions, wants more data, and fussy about minor issues.

In addition, the DISC model incorporates the use of an eight-style construct incorporating an interaction construct of the four DISC personality dimensions (Everything DISC Application Library Research Report, 2007-2009). These constructs incorporate the intersections among the four styles (D, I, S, and C) such that the styles reflect D, DI, I, IS, S, SC, C, and CD. The constructs are reflective of elements of *drive* (D), *action* (DI), *encouragement* (I), *collaboration* (IS), *support* (S), *reliability* (SC), *objectivity* (C), and *challenge* (CD). Table 1 provides the descriptions and responses used to evaluate these constructs.

The applicability of the DISC model has historically been centered on the analysis of individuals and potential placement of employees within organizational settings (Brown & Marshall, 1993; DiSCProfiles 4U, 2009). This process can be considered “profiling” through “behavioral assessment” (Furlow, 2000, p. 1). The integration of the personality assessment practices within the organization is believed valuable as a means of identifying persons who are either compatible with other team members or who will bring in needed personality traits to supplement those that already exist within a team (Profiles4u.com).

Numerous supplemental models have been developed and adapted based upon the original criteria put forth by Marston in the first DISC model. These models all maintain the same basic four axes and the alignments that are used to designate same, but these have been adapted to the needs of the adaptor. Similarly, differences in the use of the DISC model have emerged through identification of need and alignment of criteria to fit this need. It is not fully known how effective these adaptive models are in practice, as these are typically understudied and there is a lack of independent research-

Table 1

Statements Used to Measure the Priorities from the Manager's Perspective

Priority	Statement
Action	Maintaining forward momentum on your team
Action	Creating goals for the team that are inspiring
Action	Getting new projects moving quickly
Action	Encouraging the team to maintain an energetic pace
Action	Encouraging people to take risks
Encouragement	Celebrating group victories
Encouragement	Praising people for good work
Encouragement	Letting people know that you're optimistic about their progress
Encouragement	Creating enthusiasm in the team
Collaboration	Building a sense of collaboration
Collaboration	Encouraging teamwork
Collaboration	Providing feedback in a way that's warm and understanding
Collaboration	Making sure that everyone's getting along
Support	Letting people know that you are there to help them out whenever they need it
Support	Checking in with people to make sure they are doing ok
Support	Taking time to listen to people's concerns and fears
Support	Letting people know that you're patient with their mistakes
Reliability	Creating a stable work environment
Reliability	Being consistent in your management
Reliability	Checking to make sure people have the resources they need
Reliability	Giving people time to adjust to changes
Reliability	Providing people with clear guidelines for doing their work
Objectivity	Maintaining objectivity in your management decisions
Objectivity	Ensuring that decisions are based on logical analysis
Objectivity	Emphasizing the need for quality work
Objectivity	Making accuracy a top priority
Objectivity	Separating out emotions from facts when making decisions
Challenge	Challenging ideas that don't make sense to you
Challenge	Questioning employee's actions when they don't seem logical to you
Challenge	Letting people know when they aren't performing up to your standards
Challenge	Questioning procedures or practices that aren't efficient
Challenge	Providing people with new challenges
Drive	Constantly pushing yourself and others toward results
Drive	Creating a sense of urgency in the team
Drive	Getting results that are practical and concrete
Drive	Setting high expectations

Notes: From Everything DISC Application Research Report, 2007-2009, p. 15

centered data to identify the criteria found within them. For example, the Personality Pro adopted model of the original DISC model assesses the four axes but also integrates other personality modeling strategies, particularly the Myers-Briggs Type Indicator (MBTI). The rationale used to justify this adoptive strategy is that the increased flexibility of the changed model improves assessment of personality types (PersonalityPro, 2009).

Validity and Accuracy of the DISC Model

The validity and accuracy of the DISC model have been affirmed in the literature (Everything DiSC[®] Application Library Research Report, 2009). The desire to affirm accuracy and consistency for the DISC model has caused numerous researchers to approach this model and test it within multiple applications. Warburton (1993) noted that there are three criteria that can be used to test the accuracy of an assessment model within sociology. The first of these is reproducibility, where “the quality of a scale describes its ability to faithfully reflect the traits being measured” (Warburton, 1993, p. 2). The second of these is “the response scale and the number of scale points for each item,” where “if a response scale closely matches the internal response of the person, then there is a reduction in the measurement error” and results better reflect the response of the respondent (Warburton, 1993, p. 2). Third, the assessment model needs to take into account “response biases,” which could potentially generate error (Warburton, 1993, p. 2).

Warburton (1993) found that the DISC model does have strict limitations in its use, especially when it is “used to compare individuals” (p. 10). This is because the DISC model was designed to provide an overview of personality and emotional status and was not intended to be used as diagnostic criteria for events such as determining which candidate is preferable for a specific position. However, it is important to note that the DISC model is frequently used for precisely this reason and is endorsed for its effectiveness (Chrysalis Corporation, 2009; DISC Insights, 2009; Furlow, 2000; Manager-tools.com, 2009). Warburton noted that there were two exceptions to this rule:

1. The scores for a single behavioral style can be used to make valid, between-person comparisons (e.g., for the primary style) and
2. The scores on a single behavioral style (e.g., one which was ranked as most [or least] important) can be used to categorize respondents (p. 10).

However, direct person-to-person comparisons were not achievable using the DISC modeling process (Warburton, 1993). Warburton also cautioned that the model was often subject to overgeneralization, where it was easy to attach specific qualifying criteria to one of four axes and infer from the associative properties that the respondent would permanently manifest these properties regardless of circumstances, scenario, or stimuli. Again, the layperson’s literature on the DISC model appears to reflect these tendencies (Chrysalis Corporation, 2009; DISC Insights, 2009; Everything DiSC® Application Library Research Report, 2007-2009; Manager-tools.com, 2009; PersonalityPro.com, 2009).

A separate exploration of validity and accuracy of the DISC model was conducted by the Institute for Motivational Living in 2006 (Price, 2006). This organization conducted research on the effectiveness of the DISC model and appropriateness of use using the rationale that the DISC model was widely used but was likewise inappropriately used in many contexts. Also, the study addressed the issue that “personality is a vague construct that is often used to explain behavioral consistency within persons and behavioral distinctiveness between persons,” but that the basic definitions of *personality* and the corresponding terminology (e.g., traits) differed dramatically between research studies, which led to ambiguity within the data as well as the literature itself (Price, 2006, p. 1).

Similar to Warburton (1993), the Price (2006) study addressed whether the measurement tools tended toward accurate representation of the respondent’s perceptions, by default calling into question whether these tools could be used to accurately derive the respondent’s overall personality. A key finding is that of the “forced-choice item format” used in the DISC model (Price, p. 2), where the respondent is only allowed to choose between specific criteria, and therefore, any alternatives are eliminated from the screening process. This creates the perception of an accurate answer when it merely may represent the most accurate answer based on the existing items available to the respondent at the time of testing. Also, the forced-choice testing method allows the respondent to manipulate the system. Because the respondent is aware that he or she is taking a personality test and is likewise aware that the results may be used to direct specific outcomes (e.g., job placement), it is possible to ignore those answers that accurately reflect personal perceptions and instead select those that

will better position the respondent in assessment and placement. The submission of false responses is a serious limitation of the DISC model, but the existing instrument does not allow for deviation (Price, 2006).

One final criticism of the DISC model is that Marston initially created it to predict a state of normalcy within the general public. As time progressed, this suggested that all personalities and personality profiles would by default conform to the DISC model. Otherwise, personality types would not fall under the general understanding of normalcy.

The Myers-Briggs Model in Comparison to the DISC Model

Issues in accuracy and validity in respect to the DISC model may imply that an alternative modeling strategy would be a better choice in addressing personality traits. The Myers-Briggs model is another popular personality inventory, with its data applied much in the same way as the DISC model. The Myers-Briggs model is frequently used in job assessment and candidate placement (Inscape Publishing, 1996; Provost & Anchors, 1987; Sewall, 1986).

Briefly, the Myers-Briggs Type Indicator (MBTI) is a four-dimensional assessment scale in which a respondent's personality is identified through the use of "forced-choice response to pairs of phrases and single words" (Inscape Publishing, 1996, p. 2). This model differs from the DISC model in that the assessment criteria are indicative of *extraversion* or *introversion*, or how outgoing the respondent is within specific scenarios, as well as how the respondent *senses* or *intuits* information. Then,

the strategies through which the individual processes information are framed according to whether they *thought about* or they *felt* the significance of the information. The instrument also measures people's attitude toward the world in which they live; the perceiving/judging scale distinguishes people who are typically more open, curious, interested, and ultimately adaptable (perceiving) from those who are organized, purposeful, logical, and decisive (judging) (Inscape Publishing, 1996, p. 9). This creates a template in which eight dimensions of personality can be extrapolated from these four assessment criteria.

Inscape Publishing (1996) found that the theoretical origins of both the Myers-Briggs model and the DISC model were similar. The rationale underlying both models is that there are predictable indicators of personality and these can be expressed through testing (Inscape Publishing, 1996). Furthermore, if it is recognized that personality can be quantified through testing, then the results can be applied to various outcomes (e.g., job placement, social associations, etc.).

However, there were some fundamental differences within these theoretical origins:

Marston intended to explain how normal human emotions lead to behavioral differences among people as well as to changes in a person's behavior from time to time. His work focused on finding practical explanations which would help people understand and manage their experience in the world. (Inscape Publishing, 1996, p. 2)

In contrast, Myers and Briggs developed their personality modeling scheme in order to identify the "inner core of personality that first appears after birth and [traits] within human history and literature, particularly myths and symbols that explain how people through the ages have tried to understand their experience" (p. 2). In this sense,

both the DISC model and the MBTI are not merely personality assessment tools, but refer to the strategies through which an individual engages with the world around him or her and interacts with it.

Online Learning and Attrition

Retention within the distance learning environment has historically posed a distinctive set of challenges when compared to the traditional learning environment (Sheets, 1992). It is believed that the sense of community that is acquired through participation within a traditional educational environment has the ability to promote long-term positive associations for the student, thus helping the student develop a commitment to the community (Cooper, 1990; Dille & Mezack, 1991). This is especially true for younger students, as those under 25 years old are more likely to participate in the community-building aspects of the educational environment (Fields & Lemay, 1989; Iwai & Churchill, 1992).

The demographic makeup of distance learning students is significantly different from that of traditional students. Distance learning students tend to be older and to have other responsibilities that marginalize their time, such as family and work duties (Gubernick & Ebling, 1997; Iwai & Churchill, 1992; Kember, 1989). It has been noted by those who choose distance learning that the flexibility of distance learning scheduling is an advantage for those persons who are divided in their time and obligations and cannot take advantage of a traditional two-year or four-year postsecondary degree program (Iwai & Churchill; Gubernick & Ebling).

However, while the flexibility of the distance learning program is an advantage for some students, distance learning is still faced with serious challenges in student retention (Martin, 1996; Sweet, 1986). The advent of online learning and the easy access to information, such as immediate feedback from teachers and participation in an online community with fellow students, were heralded as strategies that combined the advantages of distance learning with many of the beneficial qualities of education in the traditional online campus environment (Anderson, 2009). New technologies, such as the Internet and e-mail, have improved access to online curricula and course programs and have altered the environment in which distance learning has operated in the past (Anderson, 2009; Gubernick & Ebling, 1997; Kerka, 1996).

However, the projected outcomes that were linked to online learning have not been fully realized in the classroom. Retention of students, especially working adults, remains problematic (Anderson, 2009; Kember, 1989; Martin, 1990; Phipps & Merisotis, 1999; Uba, 1997). Palloff and Pratt (2005) observed that the online learning environment has been conditionally accepted by some students, but other students have resisted participating in online classes. The authors (2005) also observed that research in online learning suggests that some students appear more likely to succeed in online classes while others are likely to prefer traditional classes, but no common factor or factors could be found that explained the difference.

Student preferences toward online or traditional learning might help explain why online education programs still find it difficult to retain students (Anderson, 2009; Palloff & Pratt, 2005). Attrition from online classes is difficult to explain, as these programs appear to have the factors deemed desirable by distance learning students

(Phipps & Merisotis, 1999). It has been suggested that this may be due to a “paucity of truly original research dedicated to explaining or predicting phenomena related to distance education,” where existing research may not examine the areas of distance learning that would adequately explain retention issues (Phipps & Merisotis, 1999, p. 1). It has also been noted that online classes appear to have unique qualities which separate it from distance learning, suggesting that it is not possible to make direct correlations between what students want from distance learning and what students want from online learning (Dietz-Uhler, Fisher, & Han, 2008). Early research conducted by Tinto (1982) suggested that there are also perennial and unavoidable problems in the methodology of all research on student attrition, where these problems are derived from limits on the scope and the focus of research efforts when addressing student performance and participation.

Tinto’s (1994) student integration model hypothesizes that persistence is related to the correlation between the individual’s academic motivation and the institution’s responses to that motivation. Tinto (1994) wrote, “It is the interplay between the individual’s commitment to the goal of college completion and his commitment to the institution that determines whether or not the individual decides to drop out” (pp. 89-90). Therefore, the student integration model describes persistence in terms of the juncture between the student’s commitment to complete college and the commitment to the institution (Carbrara, Castaneda, Nora, & Hengstler, 1992; Tinto, 1994).

The issue of retention in online learning is thus perplexing for educators (Anderson, 2009; Palloff & Pratt, 2005). Based on data gained from decades of distance learning, the structure of online learning programs has been designed to appeal to

students by combining quality education and convenience with increased feedback from classmates and from educators (Ally, 2004; Dietz-Uhler et al., 2008). Despite the informed structure of the online classroom and the advantages that online courses offer to students, attrition from online classes seems to remain a problem. It appears that while online learning programs offer many advantages to students and provide new advantages to student learning that are not available via traditional distance learning classes, problems in student retention persist.

Online Learning and Student Demographic Characteristics

Regardless of the type of educational environment, all students tend to manifest personalized learning strategies (Ally, 2004; Coggins, 1988; Mngomezulu, 1999). It has been recommended that online learning programs approach these unique and personalized information sets in order to organize and prepare classrooms in which the needs of the students are met (Kircher, 2001; Parker, 1999). It has been proposed that student personality traits could be aligned to the format and structure of distance learning classes, and analysis of personalities of students who excelled in distance learning might provide evidence that those with certain traits are more likely to succeed in a distance learning environment (Sheets, 1992). It is possible that similar analysis of personality traits and the evidence from students who succeed in online classes can be used to show that students with personalities that fit the rigors of online learning are more likely to succeed (Ally, 2004; Hall, 2008).

Ally (2004) suggested that any effective analysis of the motivational forces that influence online student activities must take into account the demographic criteria found among online learning participants, as the rationale that has led the student to choose distance learning or online education instead of traditional education is likely to indicate influences found therein. Hall (2008) asserted, “Not all students would find the web-based distance education learning environment as attractive as a traditional face-to-face environment” (para. 3). Hall proposed that personality traits might play a significant role in a student’s success in online courses.

Control over the course materials and the strategies through which interaction with these materials takes place is a significant component of why students choose to participate in distance learning classes (Altmann & Arambasich, 1982; Cook, 1997; Cooper, 1990; Dille & Mezack, 1991; Ehrman, 1990; Marsh & Richards, 1986). Control can be exhibited in multiple ways, including the time during which a student decides to complete coursework (Cook, 1997). Many students who choose to seek out and use distance learning programs are themselves adults and tend to have responsibilities in addition to education (Astin, 1991). These responsibilities often take priority over education, such as employment or family-oriented duties (Astin, 1991; Gubernick & Ebling, 1997; Iwai & Churchill, 1992; Parker, 1999). One source noted, “While society calls for lifelong learning, employment and family responsibilities call for adults to seek forms of education other than traditional, face-to-face instruction. Distance education affords adults the required formal education while allowing for flexible scheduling” (Parker, 1999, para. 4).

Although distance learning programs may require a time commitment comparable to that of a traditional educational setting, the adult student has the ability to identify when he or she will choose to spend this time as opposed to attending classes on a set schedule (Gubernick & Ebling, 1997; Parker, 1999). Data indicates that students who have a greater locus of control over the course materials and the classroom environment are more likely to remain active within education (Rotter, 1989). This research on online courses underscores that research findings from traditional classroom settings can be consistent to and comparable with research on online classroom settings (Anderson, 2009; Palloff & Pratt, 2005). If the online learning classroom delivers greater control to the student, then it is more likely that the student will remain enrolled and active within this classroom setting.

Autonomy and self-efficacy are also components of successful distance learning programs and have been shown to play a large role in why online courses are popular among some students (Anderson, 2009; Billings, 1993; Palloff & Pratt, 2005; Shrader, Parent, & Breithaupt, 2004; Van Walden, 1992). These principles are directly associated with learner styles and the ways in which certain students approach curriculum materials (Ehrman, 1990; Hall, 2008; Meisgeier et al., 1989). Some students, especially older students who have previously participated in formal education programs and who have successfully completed online courses, are more likely to be self-directed in their academic goals (Fields & Lemay, 1989; Martin, 1996; Rotter, 1966, 1989; Shrader et al., 2004). Perceptions of control are directly associated with autonomy and self-efficacy, and students who are able to achieve personal motivation in these areas of study are more likely to remain active within education in general (Rotter,

1966, 1989; Tinto, 1982). Furthermore, the literature on distance learning links these factors to control and suggests that a positive attitude towards participation in distance learning and positive outcomes gained from distance learning will facilitate retention (Sweet, 1986; Uba, 1997).

Affiliation level has also been shown to affect success in online education. Online student' sense of affiliation has been shown to influence student outcomes (Bennen, Darabi, & Smith, 2007; Chen, Jang, & Branch, 2010). In an online learning environment, affiliation involves the students' sense of belonging through social interaction and/or isolation, social presence in available methods of online communication, and the students' overall sense of community (Chen et al., 2010). Limitations inherent to the online learning environment present challenges to the development of affiliation among online students.

Research has demonstrated that student affiliation has significant effects on motivation and overall student outcomes (Chen et al., 2010; Marks, Sibley, & Arbaugh, 2005; Wegerif, 1998). According to Wegerif (1998), student identification as either an insider or outsider to the learning community affected self-perception, self-efficacy, and overall achievement. Kreijns, Kirschner, and Jochems (2003) revealed two common yet significant errors frequently made by instructors in online environments, which included (a) assuming that online social interactions happen automatically and (b) disregarding social-emotional aspects of affiliation while remaining focused on the cognitive effects of social interactions. Resulting from their analysis, Kreijns et al. (2003) provided four suggestions for promoting social interactions within an online learning environment, which included (a) using collaborative learning methods, (b)

incorporating interactive elements, (c) use and adaptation of student-centered pedagogies, and (d) increasing the sense of social presence. Kreijns et al. (2003) stressed the value of informal and casual communication and interactions, which appeared to increase the sense of community and/or belonging more effectively.

Finally, the quality of the distance learning institution is indicative of characteristics among effective schools and educators (Parker, 1999; Visor, Johnson, Schollaert, Good Mojab, & Davenport, 1995). In respect to fees, tuition cost at a distance learning school can be less expensive compared to the tuition cost at a traditional educational setting (Parker, 1999). This is especially true if elements of the campus community setting are reduced or eliminated from the student's budget such as housing and activities fees. Committed educators who are both skilled and are able to engage the student are also taking on roles of greater importance as technology improves and communication between the student and the educator increases commensurately (Diaz, 2002; Kircher, 2001; Parker, 1999). Again, these factors have been transferred successfully to explain student preference for online learning (Anderson, 2009; Hall, 2008; Palloff & Pratt, 2005).

Research in online learning shows that there are some factors unique to online learning that are not mirrored by distance learning. For example, prior experience in online education also appears to play a role in student achievement. Shrader et al. (2004) studied 60 graduates from an online university program in which all participants had achieved a Master of Arts in Learning and Technology. Shrader et al. (2004) found that students are more likely to graduate when they "(a) have an internal locus of control; (b) possess advanced degrees and higher grade point averages; (c) study at least

10 hours per week; and (d) have already successfully completed a distance learning course” (p. 11).

This information suggests that students who recognize specific obligations within the online learning program are more likely to accept the responsibilities found therein and adapt their behaviors to meet the needs of the program. Goal-setting and orientation of needs were criteria of these processes (Shrader et al., 2004).

Recommendations based upon the demographic criteria of successful participants in online education therefore suggested that “we should investigate strategies related to long-term strategic planning, big-picture thinking, self-assessment, and complex problem-solving” (Shrader et al., 2004, p. 11).

It has also been found that students who participate in online learning and are familiar with technology are more likely to succeed in online classes. Rudestam and Shuoenholtz-Read (2009) suggested that students who have experience using the Internet and have experience participating in online communities will find the requirements of the online classroom easier to manage. Students who are familiar with online communities are more likely to navigate the software without difficulty and are also more likely to use online resources that are available to participants in the classes (Rudestam & Shuoenholtz-Read, 2009). In contrast, students who are less familiar with the rigors of online communities are at risk for disenfranchisement from the class, as they are less informed than their peers about what is required to succeed (Rudestam & Shuoenholtz-Read, 2009).

Online Learning and Personality Theory

Personality theory has been examined in respect to distance and online learning in previous research efforts (Ally, 2004; Ellis, 2007). Although the literature in this area of study is sparse, there have been research studies that identify the links between specific personality types and performance outcomes in distance and online education. Dewar and Whittington (2000) used the MBTI to identify how student learners participating in online classroom environments engage with the curricula. The researchers begin in noting prior evidence that suggests that “the sociological aspects of learning style have greatest importance on distance education course completion” and that relationships formed within the classroom setting have an impact on the performance of the student (Dewar & Whittington, 2000, p. 2). The online learning environment tends to be devoid of interpersonal contact, and relationships, if any, are cultivated over computer networks, suggesting that the sociological aspects of learning are lacking within the online setting.

Dewar and Whittington (2000) hypothesized that students with certain personality types are more likely to accept this lack of socialization within the classroom and that the lack of community will not have a profound negative impact on their education; conversely, some students with other personality types may suffer these negative impacts. The researchers used the eight dimensions of the MBTI in an empirical research study using 21 voluntary participants to complete the information contained in a forced-choice item survey. The researchers found that students participating in the online distance learning programs were more likely to fall into the

sensing, thinking, and judging personality categories compared to the *intuition, feeling, and perceiving* personality categories. Dewar and Whittington (2000) admitted that the small number of participants reduced the applicability of general statements, but it appears that students who have personality types suited towards factual analysis are better suited towards participation in the online community compared to those who develop perceptions based on stimuli garnered from social interactions. The literature indicates that both *extravert* and *introvert* personality types have strengths and weaknesses within the online learning environment.

Ideas of community and connectivity are pervasive within the literature on distance education (Coggins, 1988; Hadley, 2006; Livingood, 1995; Sheets, 1992). The lack of community and connectivity are often perceived as a deficit within distance learning, where the student is believed to be forcibly removed from the traditional academic environment and his or her connection to the community is reduced. The validity of this assumption is challenged, however, in personality testing in which certain personality types – especially introverts – are able to thrive within an environment in which community-centered stressors are not present (Bail, 1995; Livingood, 1995). However, more research is needed in these areas, as these themes appear to be understudied and the results remain inconclusive.

Finally, research is now integrating personality theory into the study of technology-rich environments. In a study in which the MBTI was used to assess the perceptions and derive personality types from 660 students, Hadley (2006) hypothesized that the increase in technology within the classroom setting would be received and processed differently by students with distinctive personality types.

Hadley focused on the *sensing versus intuiting* and the *thinking versus feeling* scales and found that it was more likely that “students who were sensing had significantly higher grades in a high technology classroom than those who were intuiting” and that the “student’s preference for sensing became clearer” as time progressed and exposure to technology was continued (p. 69). Similarly, “Thinkers performed better in a high technology environment than feelers and as the clarity towards thinking increased, the grade also increased” (p. 70). This suggested to Hadley (2006) that concrete associative personality types had a strong advantage over adaptive, emotional personality types.

Summary

The literature indicates that it is challenging to retain online learning students. Research related to how the online learning student participates in the academic setting and how specific components of the student’s personality as well as the student’s association with the online learning program has indicated that the personality of the student may be a factor in retention. The DISC model is a valid and widely applicable personality assessment tool that can be used to assess the personality of the individual based on four axes of personality. A different personality modeling tool, the MBTI, tests eight components of personality and has already demonstrated applicability in assessing personality types of students engaged in distant learning. Historically, both the DISC model and the MBTI have been used to identify personality types for purposes of employment, but past use indicates that these measurement tools can likewise be used to determine engagement within academic organizations.

CHAPTER 3

METHODOLOGY

The purpose of this study was to explore the relationship between students taking online classes and their personality types. The case study focused on a group of online students at the business department at a northern Illinois community college using several data collection methods. The goal of this study was to comprehend the particular group or culture through observer immersion into the culture or group (Silverman, 2000). Although the case study approach employed was predominantly qualitative, it was supplemented by the DISC survey instrument. Creswell (1998) stated that the case study researcher uses multiple forms of data rich in context to build the in-depth case. This chapter defines and describes the strategy that applied in the research study. The chapter explores the research questions that shaped the design of the study, a detailed discussion of the methods and procedures employed in the conduct of the study, the process of data collection and analysis (including participant selection), and the rationale for establishing the study's reliability and validity. This chapter provides a detailed overview of the procedures used to collect and analyze the data.

Restatement of the Research Questions

The research questions arising from the purpose of the study are as follows:

1. Is there a relationship between a community-college students' personality type and his or her success in online courses?
2. How does community-college students' personality type support his or her online learning experience?

The research questions were developed through an initial review of the literature and from the problem statement used to govern the research. The research questions were derived after the problem statement was developed, and answering the research questions provides a solution to the problem statement.

Research Method Rationale

The use of a case study is done to identify the relationship between college students' taking online classes and their personality type. The case study approach employs open-ended questions through interviews and surveys deemed appropriate for the purposes of this study. According to Creswell (1998), case study methods should lead to information from both open and closed-ended questions, multiple forms of data, and statistical and text analysis.

Qualitative data collection procedures have historically been subject to criticism in respect to their inherent validity as a research tool. As qualitative data relies upon information reported by human subjects, the information presented in qualitative

research is inherently subjective to interpretation; this interpretation is done not only by the researcher, but by the study participants who initially report the data to the researcher. The validity of case study methods has been challenged on these grounds, but researchers have frequently attached cross-disciplinary research instruments to case studies to improve the quality and the consistency of research findings. In this study, the DISC instrument was used as an instrument that has been developed by an external source, which provides a mixed-methods component to the research study.

The case study approach has been used across disciplines as it is a “bounded and integrated system with a boundary of working parts” (Creswell, 1998, p. 61). Creswell (1998) noted further that a bounded system is constrained by time and place and the case being studied is usually a program, event, activity or individual (p. 61). Case study research is also reported to provide an in-depth exploration of intricate topics or issues (Yin, 2003). Case study research may support or perhaps contribute to an existing body of knowledge through empirical inquiry that investigates a contemporary phenomenon within its real-life context and in which multiple sources of evidence are used (Yin, 1984, p. 23). Through using a case study research method, the present research study will demonstrate a clear contribution to knowledge of individuals, community colleges, and the phenomenon of success in online classes.

The Interpretive Paradigm in Case Study Methods

The emergence of the interpretive paradigm affords social science researchers opportunity to move away from the restrictions of the positivist paradigm. The

positivist paradigm suggests that knowledge comes from the affirmation of theory through the scientific method, as it is based on the belief of objective reality. This is in contrast with the interpretative paradigm, as beliefs are based on socially constructed and subjective reality (Stake, 1995). The interpretive paradigm provided thick data, as the study was conducted as a social inquiry and this paradigm values history and culture.

The interpretation and triangulation of data, interviews, and literature provided a greater depth and breadth with regard to the research topic compared to only using a self-administered questionnaire. For the purpose of this study, triangulation is defined as research that involves more than one method, qualitative and quantitative, as a means to gather information in order to validate, confirm, and answer the research questions (Yin, 2003). Triangulation of data is also used to help identify phenomena reported by multiple subjects. The researcher is then left to interpret the data and draw conclusions (Stake, 1995). Interpretation is a major function of this design and is done through a thorough examination of the literature, interview data, and field notes (Stake, 1995).

Research Design

The case study approach was selected because it would allow the researcher to explore the lived experiences of students who have similar background experiences in online and traditional postsecondary learning and to avoid the logistical problems associated with the development of a random sample (Shadish et al., 2001). The case study is a useful research method that can be applied to a sample population to

determine whether the lived experiences of the sample show parallels or commonalities (Creswell, 1998, 2002).

Creswell (1998, 2002) suggested that the case study approach was a valid and important research tool when the basics of a question were known but additional information was required to clarify specific phenomena that might be associated with the question. Similarly, Darlington (2002) believed that the case study approach was singularly useful in providing detailed personal histories and experiences which in turn could be analyzed for consistency and commonalities. Both authors concurred that the case study method is useful in applying the results discovered in the research process to those who are in the general population and who have backgrounds or lived experiences similar to those in the sample population (Creswell, 1998, 2002; Darlington, 2002).

Based on the validity research for the Everything DiSC[®] Application Library assessment and profiles (2007-2009), it was determined that the original Everything DiSC[®]-type instrument would be useful in collecting psychometric data from a large sample population of 50 students. However, this acquired data would be insufficient for this study. The DISC instrument allowed for the collection of quantitative data; to collect the qualitative data, the researcher then communicated with the students who agreed to participate in follow-up semi-structured one-on-one interviews. This research study therefore incorporated data from a larger sample and provided means for narrowing the focus of the study to address specific questions, themes, and phenomena.

Research Procedures

There were two specific research phases procedures used in this study, one for each of the two phases of data collection. The participants for the two phases of this study were to be the same, while the methods used to collect data were to differ according to the data collection process used at the time. Detailed descriptions of the procedures applied to each of these two phases are next provided.

The case study research used for this study took place in two parts. The first was the administration of the DISC survey to 50 online business students at a northern Illinois community college, 25 of whom had successfully completed at least three online classes and another 25 who had attempted to take two or more online classes and had failed these online classes through low grades, attrition, or failing to meet other benchmarks that denote success as described by the teacher or the college.

The second part of the study was accomplished through conducting semi-structured one-on-one interviews with students from both groups. The semi-structured interviews were guided by questions derived from the literature on online learning and the needs of students. Each interview took 20 to 30 minutes to complete. All students who participated in the first part of the research study were given the opportunity to participate in the semi-structured interviews, although some attrition from the study was expected. A minimum of four participants from each group – where each participant represents a different quadrant of the four quadrants of the DISC model – were required in order to ensure that the results came from a sufficient-sized population to withstand

challenges to validity. This also was decided to ensure that there was sufficient data for analysis (Creswell, 2002).

The approach was deemed necessary to help demonstrate the significance of the research findings and to identify whether the results of the study are an appropriate representation of students who have participated in online learning. This strategy follows the rationale of the research paper and provides results that answer the research questions and resolves the problem statement.

Participants

Participants in the survey phase of the research study consisted of 50 students from two different demographic populations. The first sample was comprised of 25 online business students who attend and have participated in online courses at a community college in northern Illinois and who have successfully completed three or more online classes from the online distance learning program offered by the institution. The second sample was comprised of 25 online business students at the same community college who have attempted to take two or more online classes from the college's online distance learning program but failed to successfully complete these classes. Success was determined by the student's ability to meet the criteria established by the college, the teacher, or other performance metrics that must be obtained if the student were to have passed the class.

Following data collection using the DISC survey instrument, the researcher then asked whether the survey respondents wanted to participate in the second phase of the

research study. As further participation was also voluntary and required an additional commitment of the participants' time, it was anticipated that there would be some attrition among participants. A minimum of eight students – four from the successful group and four from the unsuccessful groups - were necessary. Within each four-person group, each student would need to represent a different quadrant of the four quadrants of the DISC Model. These requirements were necessary for the semi-structured one-on-one interviews to ensure that there was sufficient data for analysis (Creswell, 2002).

The participants were informed that their participation in the survey was voluntary and that they could leave the study at any point. If a participant left the study following the completion of the DISC survey, the data from the survey was included in the study. If a participant left following the completion of the DISC survey but prior to completing the semi-structured interview (i.e., walked out during the interview), the participant's response for the DISC survey was included, but the data provided in the semi-structured interview was discarded.

Recruitment of Participants for Survey

Participants for the survey were recruited through coordination with the community college's associate dean of instructional improvement and distance learning and faculty members who teach online courses. The recruitment was made from the college's business department. The use of one department was deemed necessary because a similar sample population was desired in order to recruit students with common and related experiences. The goal was to comprehend the particular group or

culture through observer immersion into the culture or group (Silverman, 2000). To recruit the 25 successful online students, online faculty members were asked to announce the research projects to their students and ask for volunteers who match the study's requirements. To recruit the other 25 students, student who attempted to take two or more online classes and failed them, the college's associate dean of instructional improvement and distance learning assisted in identifying a pool of candidates, who were then contacted by the researcher and invited to participate in the research.

To participate in the survey, the candidate must have met the following requirements:

- Be over the age of 18 years old;
- Have been enrolled in online learning;
- Have either completed a minimum of three online courses OR have dropped out before completing a minimum of two online courses; and
- Be willing to sign a consent form that informs them of their rights as a participant in a study using human subjects.

A total participant number of 50 students was preferred for the study in order to provide sufficient data to allow for data analysis and triangulation. The researcher collected information from as many candidates that fit the requirements for participation, and then collected data from all potential respondents. It was anticipated that a portion of the qualified candidates would decline to participate in the study.

All subjects who completed the survey were informed that their participation would be fully voluntary and that their results would be kept confidential. In research studies, confidentiality is maintained to help preserve the rights of the sample

population and to encourage participation among students who might be willing to assist researchers but are unwilling to release the details of their academic history.

Recruitment of Participants for Interviews

The researcher collected the data from students who participated in the survey and who also said they were willing to participate in follow-up research. Willingness to participate in the interviews was confirmed by the group after they completed the consent form, as the last item on the consent form provided a brief overview of the interview process. Respondents who wished to contribute to the interview process then provided their contact information on the bottom of the form. When the second phase of data collection started, the researcher contacted eight identified participants, four from each group, who were willing to participate in the one-on-one interviews and who belonged to different quadrants of the four quadrant DISC model based on the results from the first phase of data collection. All participants were again assured that their personal information would be kept confidential and would in no way be used in the research study, and that they would be identified in the interview data collection process by code (e.g., “Subject 1,” “Subject 2,” etc.).

Instrumentation and Data Collection

Instrumentation and data collection differed for the questionnaire phase and the semi-structured one-on-one interview phase. The study as a whole was a mixed-

methods research study in that it collected data using both quantitative and qualitative methods. The instrumentation and data collection that was applied to these methods is described in detail in the following sections.

Quantitative Phase

The first method of data collection applied to the survey instrument generated by the DISC instrument. There are multiple forms of DISC instruments available, and many of these have been specialized to collect data from specific populations (e.g., children and adolescents, members of religious or business organizations, etc.). The classic DISC instrument “*Everything DiSC®*” published by Inscape Publishing was applied. The classic DISC instrument was deemed appropriate because it has been independently validated through more than five decades of application and use (Everything DiSC® Application Library Research Report, 2007-2009). The classic DISC instrument is considered universally applicable for all persons who are literate, part of the Western culture, and who are thus considered familiar with the terminology and content of the questions on the test. Finally, the DISC instrument has lower costs associated with its acquisition, and the terms of licensing required by use of the classic DISC instrument allow the researcher to reproduce the results in study form.

After the study participants were recruited, the researcher made the survey instrument available online for participants to take. The researcher sent all participants an e-mail informing them of the web location of the DISC instrument and instructions for use. The respondents had two weeks to complete the survey and to submit it to the

researcher. The researcher contacted the study participants at the beginning of the second week to remind them to complete the study in a timely manner. After data collection had finished, the Everything DiSC[®] publishers, Inscape Publishing, tabulated the data and provided the researcher with a single comprehensive SPSS database with all data obtained from the participant assessments. This data included score values for each sub-scale by four characteristics (D, I, S, and C) and eight characteristics (D, DI, I, IS, S, SC, C, and CD). Data within the database provided were used directly in the analyses.

Qualitative Phase

The second phase of the research study was the semi-structured one-on-one interview phase. Instrumentation used in this phase of the research was generated from the literature review and from the results of the DISC survey, as the researcher used this information to generate follow-up questions to topics that were not satisfactorily resolved during the quantitative phase. As the qualitative phase of a mixed-methods research project is used to provide greater overall depth of response to the research questions, the researcher did not ask questions that can be answered with a simple “yes” or “no” response. The researcher instead posed open-ended questions that required thought and attention from the participants while they answered the researcher.

The qualitative phase is arguably the most important phase in the data collection process because it provides the opportunity to discover new information or clarify questions that are recognized but unresolved. The researcher serves as the instrument in

this setting. According to Stake (1995), the researcher's role is that of teacher and interpreter. Stake (1995) further asserted that within the researcher's role of teacher is the responsibility of the researcher to inform, to sophisticate, to assist the increase of competence and maturity, to socialize, and to liberate (pp. 91-92). Within the researcher's role as interpreter is the task of finding new connections and meanings to make the research finding real and comprehensible to others. The researcher is responsible for determining the respective role while collecting and interpreting data (Stake, 1995 p. 103). Several examples of role choices that must be made by the researcher are as follows:

- How much to participate personally in the activity of the case.
- How much to pose as expert and how much comprehension to reveal.
- Whether to be a neutral observer or evaluative, critical analyst.
- How much to try and serve the needs of anticipated readers.
- How much to provide interpretation about the case.
- How much to advocate a position.

For the purpose of this study, the researcher played the role of unbiased interviewer, observer, and interpreter while the findings were discovered and the story revealed. According to Creswell (1998), data collection is a series of interrelated activities, the goal of which is answering the research questions of the study. The phases of collecting data include (a) locating a site/individual, (b) gaining access and making rapport, (c) purposefully sampling, (d) collecting data, (e) recording information, (f) resolving field issues, and (g) storing data.

Trustworthiness and Credibility

The validity of the instrument and methods can be assessed by examining the quantitative and qualitative approaches used to gather data. In the quantitative phase, the DISC instrument has been validated through application and through independent assessment. The DISC Profile Web site offers 18 different articles by independent and in-house researchers that demonstrate the validity of the DISC personality profile and the applicability of a specific DISC instrument. The applicability of the DISC model is listed as one of the reasons it has proven valid as a research tool because the ease of use of the DISC model helps introduce the test-taker to the materials and guides them through the process. These strategies help promote honest, forthright answers.

Although the DISC instrument has been shown to have high validity and reliability when applied within reasonable expectations, the trustworthiness and credibility of the subjects is a consideration when qualitative research methods are applied. Historically, analysis of the perceptions, attitudes, and expectations of research participants has been problematic because the data generated is highly subjective. One person's view might be exclusive to his or her own experiences, while attitudes might change over time and because of new information. Results are therefore representative of the subject's responses at the moment the data was collected and might not be reproduced at a future time. These issues are simultaneously the single greatest strength of quantitative and mixed-methods research and a liability that reduces the likelihood that the results can be duplicated.

Triangulation was used to help improve the accuracy of the data. According to Mertens (1998), triangulation involves checking information that has been collected from different sources or methods for consistency of evidence across sources of data (p. 183). Through isolation of common codes and themes as evidenced in the subjects' responses and from the literature, self-reported data that reflects the experiences of persons who participated in online education can be included in the research. Applying triangulation improves validity through identifying discrepancies in the data and isolating conflicts in patterns.

Data Analysis

The procedures used for data analysis differed for the questionnaire phase and the semi-structured interview phase. The study as a whole was a mixed-methods research study in that it collected data using both quantitative and qualitative methods. The procedures used for data analysis that are applied to these methods shall be described in detail in the following sections.

Quantitative Phase

Data analysis of the DISC instrument was provided as part of the DISC Profile set. When a researcher acquires a license to use a DISC instrument, he or she receives information on scoring procedures. Recently, data analysis of DISC instruments has been facilitated through use of online data analysis services; when participants complete

the instrument online, the results from the survey are returned to the researcher after analysis has taken place. In addition, Inscape Publishing agreed to provide the researcher with the raw data of the surveys' results. This raw data was analyzed using SPSS software to perform chi-square tests as well as independent samples *t*-tests and multiple regression analysis to determine the effects of the independent variables (the personality characteristics) on the dependent variable (success in an online learning environment).

Qualitative Phase

The analysis of the qualitative data involved several steps, which included collection, organization, and then interpretation of the data. For the purpose of this study, the participant responses from one-on-one interviews were analyzed. The researcher was responsible for finding commonalities among responses, which indicated the presence of patterns common to multiple participants in the interview process. This study used the coding and themes method described by Creswell (2002). Coding and themes analysis allows the researcher to identify phenomena present in each participant's response and then assess these phenomena for commonality and significance.

The qualitative phase of the study was conducted using face-to-face interviews with eight subjects. The data gathered during this process was analyzed through coding procedures attached to specific phenomena. Phenomena are derived from the responses of subjects in the interviews and/or focus group that emerge following triangulation

(Creswell, 2002). Responses taken from the semi-structured one-on-one interviews were assigned by coding to common themes and categories. The themes and categories were then assessed to determine the effectiveness of the data analysis strategy (this process will be explained in Chapter 4).

The assignment of codes is an analysis method frequently used in qualitative research which allows the researcher to assign heuristic markers to phenomena isolated in the data. Assigning data to specific themes and categories is used to identify commonalities and emerging themes in the responses of the interviewees. Thick description, experiential understanding, and multiple realities are expected in qualitative case study interviews (Stake, 1995).

The semi-structured interview allows the researcher some flexibility within a bounded framework. Each interview was 20 to 30 minutes in length. Merriam (1988) recommended that this type of interview format be applied to studies of this nature, as “this format allows the researcher to respond to the situation at hand, to the emerging worldview of the respondent and to new ideas on the topic” (p. 74). Upon completion of the interviews, a crosscheck was completed using DISC results, interviews, and literature, providing triangulation.

Transferability and Reflexivity

Transferability and *reflexivity* are terms used in qualitative research that acknowledge that the researcher is the tool in the study. The incorporation of the researcher into the study helps strengthen the research collection, as the researcher’s

observance of the issues gives clarity and an active voice to the issues. Reflexivity suggests that readers be cognizant of the researcher's level of involvement, participation, and influence on the research topic. As with all research, where the researcher serves as an active participant, identifying transferability and reflexivity helps call attention to the possibility of research bias, which occurs when the researcher's involvement in the project influences the outcome. The researcher can minimize bias through awareness of the negative outcomes associated with researcher involvement while still maintaining the positive traits associated with intimate familiarity with the subject material.

Assumptions

For this study, it was assumed that all results provided by the subjects were an honest and accurate reflection of the subjects' personal perceptions, attitudes, and experiences. It was assumed that the DISC instrument could collect these responses in a manner that accurately represents the responses after data analysis has occurred. It was assumed that the researcher would be able to isolate the appropriate codes and themes from the literature and apply these to the data analysis procedures. It was also assumed that the coding process was the data analysis method best suited for deriving significant, appropriate content from the data.

Summary

Case study methods were applied to gather information from a sample population with shared background experiences. The research study used two data collection methods to assess the psychometric profiles of business students who participated in online learning at a northern Illinois community college. The DISC instrument was applied to 50 subjects from two sample populations during the quantitative phase of the research project. The DISC method and instrument have been independently validated as an effective and comparatively easy strategy for acquiring psychometric data from a sample population. Once the data from the DISC instrument had been collected and analyzed, the researcher developed questions from the results and from the literature review to ask a minimum of eight selected subjects who participated in the quantitative phase, four from each group representing the four quadrants of the DISC model, to provide detailed information in the semi-structured interview portion of the research. Data from both the quantitative and qualitative methods was used to explore and identify the relationship between students taking online classes and their personality types.

Analysis of the DISC instrument was incorporated into its use as a convenience feature offered by the DISC Profile organization. Coding of subject responses served as the source of data for common themes held by participants. This allowed the researcher to organize the information in a format that would illustrate commonalities among participant responses. Through the process of coding and themes, the researcher looked for common threads that would lead to answers to the research questions. It was

anticipated that the study would provide evidence in a mixed-methods research format that would help reveal whether certain personality types are best able to participate and succeed in online learning.

CHAPTER 4

DATA ANALYSIS

An overview of the research methodology planned for this study was presented in Chapter 3. Based on the goals of the study, a case study utilizing both quantitative and qualitative was employed in order to establish a relationship between personality and success in an online educational environment. This chapter reports on the quantitative and qualitative analyses performed and findings obtained in order to answer the research questions of the study.

This case study employed quantitative and qualitative data collection in the form of quantitative survey data (the DISC instrument) and qualitative interviews. Quantitative data obtained from the DISC instrument from a sample of 50 students was analyzed to determine if any of these or other factors of personality type and/or characteristics could be found to show a statistically significant correlation to student online success or absence of success. In addition, analysis of qualitative interview data revealed themes relevant to personal characteristics, skills, and other factors that were perceived by both successful and unsuccessful students to affect success in an online classroom environment.

The DISC personality assessment measured the level of individual personality characteristics between two groups of students – those who were able to succeed in an

online environment and those who did not demonstrate success in the online classes. For the purposes of the quantitative analysis, the dependent variable was defined as the success of a student in an online program or absence of success of a student in the online environment, with the independent variables defined as personality factors obtained through the use of the DISC instrument that may contribute to the success or absence of success for the students.

Quantitative Data Analysis

A quantitative analysis of the DISC instrument data was undertaken from 50 students, 25 deemed successful in online courses and 25 deemed unsuccessful according to the criteria described in Chapter 3. Using the DISC instrument, the personality characteristics of participants were measured and compared with success in an online environment. The Likert-type scaled items were operationalized as being continuous by utilizing a sum or average of the personality type scores received from each item on the questionnaire. Utilizing a sum of the scores from each question, a correlation analysis between constructed variables could be conducted. Pearson's correlation was chosen as the correlation analysis for this study. In addition, a hierarchical multiple regression was performed with a dependent variable of success and independent variables of the eight different personality types to determine predictive power of the independent variables to the dependent variable of success.

Participants

Participants for the quantitative analysis consisted of 50 students from two different populations. The first sample was comprised of 25 online business students from a community college in northern Illinois who have successfully completed three or more online classes from the online distance learning program offered by the institution. The second sample was comprised of 25 online business students from the same institution who have attempted to take two or more online classes from the college's online distance learning program but failed to successfully complete the courses. Success was determined by the student's ability to meet the criteria established by the college, the teacher, or failure to achieve other performance metrics that must be obtained if the student is to pass the class.

The participants were all students in the college's business department, thus providing a similar sample population in order to study a group with common and related experiences. To participate in the survey, the candidate must have met the following criteria:

- Be over the age of 18 years old;
- Have been enrolled in online learning;
- Have either completed a minimum of three online courses or have dropped out before completing a minimum of two online courses; and
- Be willing to sign a consent form that informs them of their rights as a participant in a study using human subjects.

Descriptive statistics are presented for each of eight personality styles reflected in the DISC instrument results. Statistics are provided for the eight DISC personality

styles for the overall sample as well as separately for the subsamples of successful and unsuccessful students. The results of cross tabulations and *t*-tests are presented after the descriptive statistics, followed by multiple linear regression analyses. After analysis of the eight personality styles in relation to success, an analysis was performed on each survey item characteristic to identify whether a significant correlation exists with specific traits.

Description of the Sample

The frequency counts and percentages for the sample demographics are presented in Table 2. Notably, there were more females than males in this sample (70% female, 30% male). Almost all participants had some college education (94%); nearly three quarters of the sample consisted of students between the ages of 18 and 25 years old (72%); and the majority ethnicity was Caucasian (80%).

Descriptive Statistics for Study Variables

The descriptive statistics of the personality styles assessed from DISC for the overall sample are presented in Table 3 with the subsample of students successful in the online environment and students who were unsuccessful in the online environment. The chi-square resulting from the cross tabulation, Table 4, does not reveal significance of the personality style to success. Frequency data for both subgroups are presented in Tables 5 and 6, followed by group statistics by personality type scale in Table 7.

Table 2
Frequency Counts and Percentages for Demographic Variables

Demographic Variable	Frequency Count	Percentage
Gender		
Female	35	70.0
Male	15	30.0
Age		
18 - 25	36	72.0
26 - 35	5	10.0
36 - 45	5	10.0
46 - 55	3	6.0
56 or older	1	2.0
Education		
College Graduate	2	4.0
Some College	47	94.0
Technical/Trade school	1	2.0
Race/Ethnicity		
African American	2	4.0
Asian American	3	6.0
Caucasian	40	80.0
Hispanic	4	8.0
Hispanic/Caucasian	1	2.0

Table 3
Cross Tabulation of Personality Styles and Success

	Unsuccessful	Successful	Combined
DI	4	2	6
I	7	6	13
IS	0	4	4
S	1	3	4
SC	4	1	5
C	3	3	6
CD	2	4	6
D	4	2	6
Total	25	25	50

Notes: DI = action, I = encouragement, IS = collaboration, S = support, SC = reliability, C = objectivity, CD = challenge, and D = drive.

Table 4
Chi-Square for Success and Personality Style

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.877 ^a	7	.262
Likelihood Ratio	10.635	7	.155
Linear-by-Linear Association	.003	1	.953
N of Valid Cases	50		

Notes: ^a 14 cells (87.5%) have expected count less than 5.00. The minimum expected count is 2.00.

Table 5
Personality Profile Statistics Unsuccessful Group

	Frequency	Percent	Valid Percent	Cumulative Percent
DI	4	16.0	16.0	16.0
I	7	28.0	28.0	44.0
S	1	4.0	4.0	48.0
SC	4	16.0	16.0	64.0
C	3	12.0	12.0	76.0
CD	2	8.0	8.0	84.0
D	4	16.0	16.0	100.0
Total	25	100.0	100.0	

Notes: DI = action, I = encouragement, IS = collaboration, S = support, C = reliability, C = objectivity, CD = challenge, and D = drive.

Table 6
Personality Profile Statistics Successful Group

	Frequency	Percent	Valid Percent	Cumulative Percent
DI	2	8.0	8.0	8.0
I	6	24.0	24.0	32.0
IS	4	16.0	16.0	48.0
S	3	12.0	12.0	60.0
SC	1	4.0	4.0	64.0
C	3	12.0	12.0	76.0
CD	4	16.0	16.0	92.0
D	2	8.0	8.0	100.0
Total	25	100.0	100.0	

Notes: DI = action, I = encouragement, IS = collaboration, S = support, SC = reliability, C = objectivity, CD = challenge, and D = drive.

Table 7
Group Statistics

	Success*	N	Mean	Std. Deviation	Std. Error Mean
DI scale	0	25	.1609	.45012	.09002
	1	25	-.0682	.52441	.10488
I scale	0	25	.1368	.51654	.10331
	1	25	.1894	.53136	.10627
IS scale	0	25	-.1761	.43344	.08669
	1	25	.0819	.48658	.09732
S scale	0	25	-.0653	.39155	.07831
	1	25	.0608	.43628	.08726
SC scale	0	25	-.0242	.50848	.10170
	1	25	.0185	.47151	.09430
C scale	0	25	-.0227	.55092	.11018
	1	25	-.1308	.52186	.10437
CD scale	0	25	-.0275	.59906	.11981
	1	25	-.1499	.54401	.10880
D scale	0	25	.0151	.54192	.10838
	1	25	-.0336	.57139	.11428

Notes: * Successful group = 1; Unsuccessful group = 0. DI = action, I = encouragement, IS = collaboration, S = support, SC = reliability, C = objectivity, CD = challenge, and D = drive.

Cross Tabulations Accounting for Demographics

In order to assess any effect from demographic differences on outcome, cross tabulations were performed using success, personality style, and demographics (gender, age, education level, and ethnicity). The results are provided in Table 8. The only significance was seen with gender, which demonstrated a chi-square value at the $p < .05$ significance level for females.

Test of Two-Sample Difference

Because the t -test was based on an equal variance assumption of the two independent samples, prior to conducting t -tests for assessing whether differences in personality styles between the two groups (successful and unsuccessful) are significant or not an F -test was performed to validate the use of t -test in this situation. Results of the F -test revealed that all p -values are greater than .05, indicating that there is not enough evidence to reject the equal variance hypothesis. Therefore, it is appropriate to use a t -test to assess the differences between the two groups. F -values are provided in Table 9.

Results from t -tests of two independent samples are shown in Table 10. The results suggest that the difference in personality scale is not significant between the two groups on all but one factor. The IS scale is significant at the .05 level with a negative t -value, indicating a reversal in the directionality of the effect. It is noted that the DI scale demonstrates near significance at the .10 level.

Table 8
Cross Tabulation Accounting for Demographics

Pearson's Chi Square	Value (N of valid cases)	df	Asymp. Sig (2-sided)
Gender			
Female	14.07 (35)	7	.044
Male	6.295 (15)	6	.391
Total Gender	8.877 (50)	7	.262
Age			
18-25	9.300 (36)	7	.232
26-35	1.875 (5)	3	.599
36-45	*(5)		
46-55	3.000 (3)	2	.223
56+	*(1)		
Total Age	8.877	7	.262
Education			
College Graduate	*(2)		
Some College	9.983 (47)	7	.190
Technical/Trade School	*(1)		
Total Education	8.877 (50)	7	.262
Ethnicity			
African American	*(2)		
Asian American	3.000 (3)	2	.223
Caucasian	9.013(40)	7	.252
Hispanic	*(1)		
Hispanic/Caucasian	*(1)		
Total	8.877	7	.262

Notes: * No statistics computed because success and/or style are constant

Table 9
F-test Results for Personality Type

		Levene's Test for Equality of Variances	
		<i>F</i>	Sig.
DI scale	Equal variances assumed	.001	.974
	Equal variances not assumed	-	-
I scale	Equal variances assumed	.030	.864
	Equal variances not assumed	-	-
IS scale	Equal variances assumed	.191	.664
	Equal variances not assumed	-	-
S scale	Equal variances assumed	.018	.895
	Equal variances not assumed	-	-
SC scale	Equal variances assumed	1.083	.303
	Equal variances not assumed	-	-
C scale	Equal variances assumed	.005	.941
	Equal variances not assumed	-	-
CD scale	Equal variances assumed	.409	.525
	Equal variances not assumed	-	-
D scale	Equal variances assumed	.018	.894
	Equal variances not assumed	-	-

Notes: DI = action, I = encouragement, IS = collaboration, S = support, SC = reliability, C = objectivity, CD = challenge, and D = drive.

Table 10
Independent *T*-test for Personality Type

		T-test for Equality of Means						
		<i>t</i>	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Conf Interval of the Difference	
							Lower	Upper
DI scale	Equal variances assumed	1.658	48	.104	.22912	.13822	-.04878	.50703
	Equal variances not assumed	1.658	46.922	.104	.22912	.13822	-.04895	.50720
I scale	Equal variances assumed	-.355	48	.724	-.05263	.14821	-.35062	.24537
	Equal variances not assumed	-.355	47.962	.724	-.05263	.14821	-.35063	.24538
IS scale	Equal variances assumed	-1.980	48	.053	-.25800	.13033	-.52004	.00404
	Equal variances not assumed	-1.980	47.372	.054	-.25800	.13033	-.52013	.00413
S scale	Equal variances assumed	-1.075	48	.288	-.12608	.11724	-.36182	.10965
	Equal variances not assumed	-1.075	47.449	.288	-.12608	.11724	-.36189	.10972
SC scale	Equal variances assumed	-.308	48	.759	-.04276	.13869	-.32161	.23610
	Equal variances not assumed	-.308	47.729	.759	-.04276	.13869	-.32165	.23614
C scale	Equal variances assumed	.712	48	.480	.10805	.15177	-.19711	.41320
	Equal variances not assumed	.712	47.860	.480	.10805	.15177	-.19713	.41322
CD scale	Equal variances assumed	.756	48	.453	.12237	.16184	-.20303	.44778
	Equal variances not assumed	.756	47.561	.453	.12237	.16184	-.20311	.44786
D scale	Equal variances assumed	.309	48	.759	.04866	.15750	-.26801	.36534
	Equal variances not assumed	.309	47.866	.759	.04866	.15750	-.26804	.36536

Notes: DI = action, I = encouragement, IS = collaboration, S = support, SC = reliability, C = objectivity, CD = challenge, and D = drive.

Multiple Regression on Eight Personality Styles

Hierarchical regression is used to predict trends between a set of metric or dichotomous independent variables and the dependent variable. A hierarchical multiple regression was therefore performed with a dependent variable of success and independent variables of the eight different personality types. Prior to conducting the multiple regression analysis, the data was screened for linearity, normality, and outliers. The dependent variable is dichotomous, providing linearity with the independent variables. Normality was demonstrated through construction of a P-P probability plot. Outliers were not observed on scatter plot graphs for each independent variable. Multicollinearity was assessed using the variance inflation factor (VIF) (values < 3) and tolerance ($> .3$).

A sample size of 15 for every predictor variable is normally suggested to obtain valid results, with a minimum of a 5-to-1 ratio (Hair, Black, Babin, Anderson, & Tatham, 2007). Although the sample size of 50 met the minimum 5:1 ratio for use of the multiple regression, the small sample size created a limitation in meeting only the minimum sample size for validity of the model.

Results are presented in Tables 11, 12, 13, and 14. It is noted that the model produced no evidence of significance for the effect of the independent variables on success. The first model using the four styles (D, I, S, and C) demonstrated virtually no effect on the variance of the DV of success ($R^2 = .021$). The second model inclusive of the style interactions (DI, IS, SC, and CD) demonstrated a very small effect of 5.4% on the variance of the DV ($R^2 = .054$, $p = .104$), although not significant. Upon inclusion

Table 11

Hierarchical Regression Models of Success in Online Learning

Model	Independent Variable(s)	R^2	R^2_{adj}	ΔR^2	β	t	p
1	D	.021	.001	.21	-.146	-1.021	.312
2	D	.024	-.018	.002	-.127	-.821	.416
	I				.051	.331	.742
3	D	.024	.040	.000	-.094	-.353	.726
	I				.069	.353	.726
	S				.038	.151	.881
4	D	.040	-.045	.016	-.137	-.502	.618
	I				-.133	-.436	.665
	S				.097	.371	.713
	C				-.250	-.863	.393

Notes: Dependent variable = success. D = dominance, I = influence, S = steadiness, and C = conscientious.

Table 12

ANOVA Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.266	1	.266	1.042	.312 ^a
	Residual	12.234	48	.255		
	Total	12.500	49			
2	Regression	.294	2	.147	.566	.572 ^b
	Residual	12.206	47	.260		
	Total	12.500	49			
3	Regression	.300	3	.100	.377	.770 ^c
	Residual	12.200	46	.265		
	Total	12.500	49			
4	Regression	.499	4	.125	.467	.759 ^d
	Residual	12.001	45	.267		
	Total	12.500	49			

Notes: a) Predictors: (Constant), D; b) Predictors: (Constant), D, I; c) Predictors: (Constant), D, I, S; d) Predictors: (Constant), D, I, S, C; and e) Dependent variable = success.

Table 13

Hierarchical Regression Models of the 4 Style DISC Interaction Construct

Model	Independent Variable(s)	R^2	R^2_{adj}	ΔR^2	β	t	p
1	DI	.054	.034	.054	-.233	-1.658	.104
2	DI	.112	.074	.058	-.193	-1.385	.172
	IS				.243	1.746	.087
3	DI	.118	.060	.006	-.265	-1.396	.169
	IS				.222	1.525	.134
	SC				-.106	-.562	.577
4	DI	.130	.052	.012	-.209	-1.029	.309
	IS				.378	1.536	.132
	SC				-.056	-.284	.778
	CD				.184	.788	.435

Notes: Dependent variable = success. DI = action, I = encouragement, IS = collaboration, S = support, SC = reliability, C = objectivity, CD = challenge, and D = drive.

Table 14

ANOVA Summary

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.677	1	.677	2.748	.104 ^a
	Residual	11.823	48	.246		
	Total	12.500	49			
2	Regression	1.397	2	.698	2.957	.062 ^b
	Residual	11.103	47	.236		
	Total	12.500	49			
3	Regression	1.473	3	.491	2.048	.120 ^c
	Residual	11.027	46	.240		
	Total	12.500	49			
4	Regression	1.623	4	.406	1.678	.172 ^d
	Residual	10.877	45	.242		
	Total	12.500	49			

Notes: a) Predictors: (Constant), DI; b) Predictors: (Constant), DI, IS; c) Predictors: (Constant), DI, IS, SC; d) Predictors: (Constant), DI, IS, SC, CD; and e) Dependent Variable: success.

of the IS scale, this increased to a small effect on the DV ($R^2 = .112$, $p = .062$); although still not significant, the second model approached significance at the $p = .05$ level.

From the ANOVA results (Table 14), the F-ratio (2.957) suggests that though the model is better at predicting the outcome than using the mean, this improvement is only approaching significance ($p = .062$). Beta values suggest a positive relationship between IS and success and a negative relationship between the DI scale with success (Table 13). However, these relationships do not demonstrate significance.

Analysis of Each Personality Item

In order to investigate individual characteristics measured with the DISC instrument on a per-item basis, participant responses on individual items (questions) on the survey were analyzed using a standard multiple regression with individual items grouped by scale and accounting for demographic characteristics of age, gender, and race and/or ethnicity. Normality, linearity, and outliers were identified by P-P plot, histogram, and scatterplots for individual variables. Each scale consists of 10 individual items and/or examined characteristics. The sample size meets the minimum 1:5 ratio for regression analysis. However, due to the small sample size, results were limited.

Standard Multiple Regression

Each item on the survey was grouped by relevance to an individual scale. Results are given in Table 15 for items demonstrating significance or near significance.

Table 15
Significant ANOVA Items

		Sum of Squares	df	Mean Square	<i>F</i>	Sig.
demanding	Between Groups	3.920	1	3.920	3.191	.080
	Within Groups	58.960	48	1.228		
	Total	62.880	49			
insistent	Between Groups	5.780	1	5.780	6.249	.016
	Within Groups	44.400	48	.925		
	Total	50.180	49			
compelling	Between Groups	7.220	1	7.220	6.564	.014
	Within Groups	52.800	48	1.100		
	Total	60.020	49			
inspiring	Between Groups	5.780	1	5.780	7.301	.009
	Within Groups	38.000	48	.792		
	Total	43.780	49			
dynamic	Between Groups	4.500	1	4.500	4.991	.030
	Within Groups	43.280	48	.902		
	Total	47.780	49			
tactful	Between Groups	1.620	1	1.620	2.884	.096
	Within Groups	26.960	48	.562		
	Total	28.580	49			
cooperative	Between Groups	1.280	1	1.280	3.097	.085
	Within Groups	19.840	48	.413		
	Total	21.120	49			
kind	Between Groups	2.000	1	2.000	3.200	.080
	Within Groups	30.000	48	.625		
	Total	32.000	49			
caring	Between Groups	1.620	1	1.620	2.761	.103
	Within Groups	28.160	48	.587		
	Total	29.780	49			
modest	Between Groups	3.380	1	3.380	2.982	.091
	Within Groups	54.400	48	1.133		
	Total	57.780	49			
critical	Between Groups	3.920	1	3.920	4.021	.051
	Within Groups	46.800	48	.975		
	Total	50.720	49			
stern	Between Groups	3.380	1	3.380	2.836	.099
	Within Groups	57.200	48	1.192		
	Total	60.580	49			

The full results are provided in Appendix A. Accounting for demographic characteristics within scale D, the analysis suggests a significant correlation between success and the individual items denoting *insistent* ($p = .016$) as well as a nearly significant correlation with *demanding* ($p = .080$). Within Scale DI, the analysis suggests a significant correlation between success and *compelling* ($p = .014$), *inspiring* ($p = .009$), and *dynamic* ($p = .030$). Within the I scale, items of *outgoing* ($p = .158$) and *high-spirited* ($p = .176$) were closest to demonstrating near significance but were still not significant. IS scale items of *cooperative* ($p = .085$), *kind* ($p = .080$), and *caring* ($p = .103$) demonstrated near significant correlations. The only S scale item demonstrating correlation with success was *tactful* ($p = .096$), with a nearly significant effect on the model. The SC scale showed a nearly significant correlation with *modest* ($p = .091$). C scale items provided no significant correlations or predictability. Finally, DC scale item *critical* ($p = .051$) was correlated with success and *stern* ($p = .099$) was nearly significantly correlated with success.

Summary of Quantitative Findings

Independent sample *t*-tests suggest an effect of personality characteristics common to type IS and, to a lesser degree, DI on success; however, cross tabulation with demographics suggests that the gender demographic had a significant effect on personality style. Hierarchical regression did not support differences in success according to personality style, with only near significance to the $p = .05$ level for the model inclusive of types DI and IS. Although limited by the small sample size, the

standard regression analysis suggests a significant correlation between success and the individual items of *insistent* (D scale); *compelling*, *inspiring*, and *dynamic* (DI scale); and *critical* (DC scale). Only nearly significant correlations were determined for the D scale item of *demanding*; IS scale items of *cooperative*, *kind*, and *caring*; S scale item of *tactful*; SC item of *modest*; and DC item of *stern*. These individual item correlations will be used to collaborate with the qualitative findings from which the researcher sought to reveal participant descriptions of personality characteristics that affect success.

Qualitative Data Analysis

A case study analysis was used to answer the research questions of the study with raw data obtained through interviews with eight interview participants, four from each group (successful/unsuccessful), where each student represented a different quadrant of the four quadrants of the DISC Model. Each interview lasted approximately 20 to 30 minutes. In conducting this multiple case study, qualitative data analysis followed an open-coding procedure incorporating a three-step process outlined by Miles and Huberman (1994) which included (a) data reduction, (b) data display, and (c) conclusion drawing and verification. In the process of data reduction, the material was investigated and relevant data was selected in a “purposeful, non-random manner” (Shkedi, 2005, p. 86).

Data resulted from interviews with two groups (or cases), which were comprised of four successful students who demonstrated success in online courses and four

unsuccessful students who did not demonstrate success in an online course or courses. Nvivo9[®] qualitative analysis software was used as an aide in the interview data analysis. The multiple case study approach (Creswell, 2005; Leedy & Ormrod, 2005) employed for qualitative analysis in this study utilized both within-case and across-case analysis to reveal themes and common elements within each group as well as across the two groups.

The case study data analysis for this study was completed through an analysis of data from each case through coding of the transcribed interview data (Creswell, 2007). Coding was accomplished by reviewing the data and systematically identifying and categorizing characteristics or specific answers to open-ended questions, which become the key variables of the analysis (Merriam, 1998). The analysis followed Merriam's recommendations regarding grouping codes according to content. Initially, analysis of the data obtained from the one-on-one interviews employed axial coding (the process of relating codes to each other via a combination of inductive and deductive reasoning). The interviews were analyzed to identify similar occurrences. Each occurrence was then compared with an occurrence in the same set or in a different set. These initial comparisons create the categories. As the analysis process continued, comparisons were continually made until all categories were established.

In conducting this multiple case study data analysis, the three-step process outlined by Miles and Huberman (1994) was used which included (a) data reduction, (b) data display, and (c) conclusion drawing and verification. In the process of data reduction, data is investigated and relevant data is selected in a "purposeful, non-random, manner" (Shkedi, 2005, p. 86). Initially, elements of the textual data were

listed (horizontalization) and examined for relevance to the research questions and the topic under investigation (reduction and elimination). Second, patterns in the text were identified and clustered to develop thematic categories (clustering and thematizing or contextualizing). Third, the iterative process was used to check compatibility of the patterns and themes identified in the text (validation of themes). Finally, verbatim examples from the text were included in the findings to provide in-depth understanding of the themes (textual description).

The revealed themes were then further categorized, yielding the different perceived elements central to the phenomena. The final step provided a comprehensive review of the data and interpretation of the data to provide the analytical conclusions. The multiple case study analysis provided themes within each case (within-case analysis) followed by a cross-case analysis, which provided common themes across both cases allowing for interpretation and study conclusions (Lincoln & Guba, 1985).

Findings

Through the process of the data analysis, common relevant invariant constituents (responses, statements, or expressed perceptions or thoughts) of the interview participants were coded and documented for frequency determination. The invariant constituents were then categorized into related thematic categories to reveal the themes related to the research questions within each group (case). The findings resulting from the within-case data analysis were then compared and analyzed across the two cases to reveal common themes across the groups (cases).

Within-Case Analyses

Findings from the data analysis within each group or case are provided and include the invariant constituents and associated frequencies for interview participant responses. The first case, successful students, included a group of four students who demonstrated success in online courses in terms of completing a minimum of three online courses. The second case, unsuccessful students, included a group of four students who failed to demonstrate success within the online environment as demonstrated by two or more attempts to take online classes – resulting in failure. The analysis provides detailed textural data along with the invariant constituent and frequency data in order to develop an in-depth understanding of the experiences and perceptions of interview participants.

Successful Students

The first group of students was characterized by success in at least three online courses. The students were asked open-ended questions relating to their personal online course experience, personality characteristics perceived to be critical for online course success, and specific skills and other factors perceived to promote online course success. Participants were additionally asked to provide their perceptions of the DISC instrument. Perceptions of the participants in the successful student group are provided according to these categories.

Online Course Experience. Participants were asked to describe their lived experience and perceptions related to online courses. Invariant constituents central to this category included that participants (a) enjoyed the interactive environment of the online course, (b) enjoyed the freedom and flexibility of the online course, and (c) perceived the teachers for the online courses to be helpful. Participants from the successful group described their online experience as enjoyable in terms of the interaction with peers and teachers and the freedom and flexibility offered by the course. Table 16 provides the invariant constituents and related frequencies coded within this category.

Table 16

Online Course Experience of Successful Group

Invariant Constituent	No. of Participants Responding
Enjoy the interactive environment and availability of others online	3
Enjoy the freedom, flexibility, and convenience of online environment	3
Teachers helpful and always available	3
Found the self-discipline difficult at first to keep up with coursework/ second class was easier	2
Once learned the D2L, became more comfortable and confident	1
Cannot always find classes needed	1
D2L platform is user friendly and useful	1
Online environment allows students to be more open and participatory	1
Liked some teachers' styles and disliked others	1

The successful participants expressed enjoyment of aspects of the program involving communication and the interactive environment. Participant 2 stated, “I always enjoyed the interactive environment offered by the online discussion board and the availability of other students to chat with whenever online.” This was echoed by Participant 4, who also mentioned several other invariant constituents within this category:

The teachers have been really great, they’re pretty quick at e-mailing me back when I need them to, clarifying instruction, I like the discussion board because it is a good way to know my classmates by talking and chatting with them online. (Participant 4)

Participant 3 also noted the interactive environment, as well as the flexibility of the online environment, stating:

I liked it because it allowed me the flexibility to complete the task, and assignment at my own leisure. It was good in that the interaction with the other students and the instructor even though it was not face-to-face, they were definitely some good discussion going back and forth. (Participant 3)

The concept of flexibility of the online course was a positive experience for participants, many of whom worked while also attending school. Participant 1 stated, “I have taken more than five online classes, I enjoyed the freedom of the online environment and appreciate its flexibility. I work full time and taking classes online always worked for me.” Similarly, Participant 4 described the flexibility of online courses as related to the need to work:

I work two part-time jobs and I am in full-time school, so it is nice to be able to work when I have time if it is either late at night or early morning, the online classes are so convenient to me, I can study whenever I have time. (Participant 4)

The flexibility of the course was also related to the availability of teachers.

Most of the participants noted the helpfulness and availability of teachers and the resulting effect on their success in the online courses, as seen by some of the previous remarks. For example, Participant 1 noted, “Teachers are great and very helpful, they are always there when you need them.”

Some of the successful students recalled the transition to online education to be difficult in terms of the required self-discipline and confidence, particularly in terms of use of the D2L system. Participant 2, for example, stated,

At the beginning I found it hard to follow up with online course work, because it required self-discipline and I have to train myself an how to do that... Once I learned how to navigate through D2L, I became more comfortable and confident in my course work. (Participant 2)

Similarly, Participant 3 noted difficulty at first followed by growing confidence in subsequent courses: “The second class I took was much easier, and I enjoyed it much more” (Participant 3).

Personality Characteristics Perceived to be Important to Online Success

The successful group participants provided responses to questions revealing their personal perceptions of personality traits that they perceived to be essential to success in an online course environment. Invariant constituents representing the most frequent responses included (a) focused and self-disciplined, (b) organized, (c) determined and hard-working, and (d) motivated. Table 17 provides the invariant constituents and related frequencies within this category.

Table 17

Personality Characteristics Perceived to Contribute to Online Success:

Successful Group

Invariant Constituent	No. of Participants Responding
Focused and self-disciplined	4
Organized	3
Determined/hard working	3
Motivated	2
Non-distractible	1
Independent learner	1
Positive, open-minded/ not take things personally	1

All the participants in the successful group described personality characteristics of self-discipline and focus as a critical to success in an online course environment. Participant 3, for example, stated: “You have to be very disciplined and focused.” Most participants noted more than one invariant constituent in this category. In addition to personality characteristics reflecting self-discipline and focus, personal traits of organization, determination, strong work ethic, and being motivated were noted by respondents in the successful group. These characteristic traits were noted by Participant 2, who noted the following characteristics: “Self disciplined, organized, focused, motivated, self-taught, and I truly believe that those who mostly succeed online are those who take pride in self-teaching and independently working.”

Participant 4 provided detail concerning this category, describing the successful online student as:

You have to be determined and hard working, I have a brother who tried taking an online class but wouldn't sit down to do his work until the very last minute, where I kind enjoy sitting down checking my discussion board every few minutes, If I have a day off or sitting down at lunch I would check my e-mail and homework, I actually enjoy homework so I think that help. I am also patient and consistent; when I start work on something I will finish it. You have to always take the initiative when it comes to your study, and you have to be kind of disciplined. Managing your time is another important attribute; you have to be able to manage your time and to stick to your schedule and never fall behind in your work. (Participant 4)

Specific Skills to Promote Success. Successful group participants noted specific skills that were perceived to promote success in an online course environment. Key invariant constituents to this category included (a) time management skills, (b) reading and writing skills, (c) technology skills – including computer and Internet skills, (d) communication skills, and (e) independent and/or self-learning skills. Table 18 provides the variety of invariant constituents and related frequencies.

Table 18

Specific Skills Perceived to Promote Success: Successful Group

Invariant Constituent	No. of Participants Responding
Time management	4
Reading/writing skills	4
technology skills (computer and/or Internet)	4
Communications Skills	3
Independent learning skills and/or ability to self-teach	2
Typing	2
Ability to understand coursework	1

All participants in the successful group noted time management, reading and writing skills, and technology skills as critical to promote success in online courses.

Participant 2 mentioned several of these invariant constituents, describing:

Knowledge of computer and the Internet skills and their overall knowledge of technology are crucial for online student success. Typing skill as well as reading and writing skill are also crucial. The students' ability to manage time proficiently and to stay current with their studies, because everything online is tied up to time. Also, the ability to study independently and to communicate effectively. (Participant 2)

The importance of reading and writing skills in the online environment was stressed by participants. For example, Participant 1 noted, "You have to be able to read and write perfectly, because that will make your online class experience much easier and will guarantee your success." Similarly, Participant 4 described,

I absolutely love reading, and I think having online classes, it has a lot to do with reading, pretty much everything that is done on D2L requires reading and more reading, so reading is key to succeed in your online. (Participant 4)

Additional skills related to the ability to learn independently and self-teach were noted by two participants. Participant 4 described this invariant constituent as well as the D2L system used:

The ability to teach yourself is very important, the ability to figure things out on your own, that is also what I expected online courses to do. I can work things out on my own rather than someone else telling me how to and what things mean. You need to be proficient on how to use computer and the Internet, you need to learn D2L, it was a little confusing at first but everything is pretty categorized and pretty well-done, like the e-mail, the discussion board, and you can check your grade online. So D2L as a tool is very sufficient in providing the material online. You have definitely to research information on your own so you have the ability to understand the coursework.

Other Perceived Factors Contributing to Online Success. The successful group noted several other factors that were perceived to contribute to success in an online learning environment. Some responses given by interview participants to this open-ended question reflected elements of specific skills or personality traits and were therefore grouped within those categories. The remaining factors lacked more than a single mention by a single participant, but included the following factors as perceived by the successful group:

- Ability to do things at home and/or a balance of work, home, and study.
- Able to count on classmates and teachers.
- Ask for help when needed.
- Support of others, especially family.

It should be noted that these factors seemed to center on a theme of support provided by others, inclusive of classmates and/or peers, teachers, and family.

Participant 1 noted the need to for this support: “Ask for help when you need it. You have to be able to count on your classmates for bouncing ideas back and forth and on your teacher for guidance and assistance.” Participant 3 also noted the need for support from others and being able to “bounce” ideas off of others, stating:

The support of others, especially family member, for example when somebody else is using the computer and you need it to do your work they will give to me right away. The ability to bounce ideas off my husband especially when we are discussing a certain topic in our class. I always like to get another person’s aspect and opinion. (Participant 3)

Perceptions of the DISC Instrument. Participants evaluated the DISC personality instrument used in this investigation and provided their opinions and

perceptions of the instrument. Invariant constituents (responses) revealed to be most frequent within this category included that the instrument was (a) easy to take and understand, (b) an accurate assessment of their personality, (c) useful and helpful in terms of understanding oneself and others, and (d) enjoyable to take. Table 19 provides the invariant constituents and related frequencies for this category.

Table 19

Perceptions of the DISC Instrument: Successful Group

Invariant Constituent	No. of Participants Responding
Easy to take and understand	4
Accurate	3
Useful/helpful information to understand others and self	3
Enjoyed taking	2
Felt comfortable taking	1
Practical	1
Simplistic	1
Wish was an in-between selection	1

Perceptions of the DISC instrument demonstrated similarity across participants, with many participants noting several invariant constituents at once. Participant 2 stated:

I think it was pretty accurate in assessing my personality. It also guided me on how to deal with other people and how to understand others in a better way. The instrument was easy to take and I actually enjoyed it. (Participant 2)

Similarly, Participant 1 noted:

It was very practical, and easy to take. I liked the simplicity of it and I enjoyed taking it. It definitely explained my personality correctly and accurately. I enjoyed reading the detailed explanation of the result, I think it is very useful for me to understand myself and it gave me the ability to understand others as well. (Participant 1)

Unsuccessful Students

The second group of students was characterized by failure in online courses demonstrated by two or more attempts at taking online courses resulting in failure or dropping the class. As with the successful group, the students in this group were asked open-ended questions relating to their personal online course experience, personality characteristics perceived to be critical for online course success, and specific skills and other factors perceived to promote online course success. Participants were additionally asked to provide their perceptions of the DISC instrument. Perceptions of the participants in the unsuccessful student group are provided according to the above-mentioned categories.

Online Course Experience. Participants were asked to describe their lived experience and perceptions related to online courses. Key invariant constituents in this category included that participants (a) felt they were unable to keep up, (b) perceived the teachers for the online courses to be helpful, (c) liked the convenience and flexibility of the online course, and (c) perceived selves as lazy at times, which contributed to falling behind and ultimately failure. Participants from the unsuccessful

group frequently described their online experience as overwhelming or plagued by the inability to keep up-to date on the workload. Table 20 provides the invariant constituents and related frequencies within this category.

Table 20
Online Course Experience: Unsuccessful Group

Invariant Constituent	No. of Participants Responding
Could not keep up	3
Teachers helpful	3
Liked convenience and flexibility	3
Lazy at times	2
All the work was due at the end of the class, got behind and could not make it	1
At first overwhelmed	1
Different expectations of teachers	1
Problems with technical issues and/or D2L	1
Required a lot of my time	1

Like the successful group participants, the unsuccessful group participants noted difficulties and the feeling of being overwhelmed initially in an online course. However, unlike the successful group participants – who became more comfortable – the unsuccessful group participants noted their inability to keep up with the work load associated with the online course. For example, Participant 5 expressed these ideas as well as touched on other invariant constituents:

The first time I took an online class here... I was overwhelmed with the amount of work I needed to do, I was always trying and working hard to catch up. The teachers were very helpful but I could not find enough time to sit down and do my work, and halfway through the class I started to lag behind to a point where I couldn't keep up anymore, so I decided to drop the class. The second class I took was an easier class, but it required a lot of my time. Again at the beginning I worked very hard, but slowly lost interest and couldn't catch up, I am kind of lazy at times, so after a long struggle I dropped that class too. (Participant 5)

Participant 6 described a similar experience,

The first online class I took the beginning of it was OK; the first week went well and I kept up with my assignment and studies, but after that I started to fall behind because all the other stuff that was happening in my life took my attention away and I got lazy with it, actually I felt like it is a burden and it was the last thing I need to deal with. The other thing was just because that much stuff was not due till around the end of the class and then I have to read so much to catch up, and there was so much work entailed in it than actual classroom so I failed this class. The second one I took, I thought things going to be better, but guess what, the same thing happened again and I ended up failing that class too so now I only take face-to-face classes and I have been doing well in all of them. (Participant 6)

Similar to the successful group, the unsuccessful praised the flexibility and convenience of the online courses. Participant 8, while noting common themes within this category such as not being able to keep up, also described the positive aspects of the flexibility of the course, stating:

I like them, they are good for me because I can study and do my homework at my own pace, and I don't have to be around people. The only problem I have is technical issues such as downloading the follow up information from D2L to my computer. I had great time learning in the two classes that I took and the teachers were very helpful but I wasn't able to complete them because I couldn't keep up. (Participant 8)

Personality Characteristics Perceived to be Important to Online Success. The unsuccessful group participants provided responses to questions revealing their personal perceptions of personality traits perceived to be essential to success in the online course environment. Invariant constituents representing the most frequent responses included (a) focused, disciplined, and responsible; (b) analytical and organized; (c) determined, persistent, and hard-working; and (d) independent and self-motivated. Table 21 provides the invariant constituents and related frequencies within this category.

Table 21
Personality Characteristics Perceived to be Important to Online Success:

Unsuccessful Group

Invariant Constituent	No. of Participants Responding
Focused, disciplined, responsible, determined	4
Analytical and organized	3
Seeks help when needed/follows up	3
Independent/self-motivated	2
Motivated	2
Dedicated	1
Not outgoing person/private	1
Persistent (perseverance)	1

All the participants in the unsuccessful group noted advantages of being disciplined, focused, responsible, organized, and analytical for success in online courses. Participant 7 simply stated, “You have to be focused and serious about your classes and your education.” Participant 6 also described the need to be disciplined and focused, as well as organized, noting:

You have to be organized and determined and just do your assignment on time, you have to be one of those people that really thrive, I know I am trying to get better at that but certain things happen and you I get easily distracted, I think in online classes you have to be focused and determined. (Participant 6)

In addition, personality characteristics of being determined and persistent as well as being independent and self-motivated were noted as beneficial to success in the online environment by half of the participants in this group. Participant 5 described the perceived need to be an independent learner:

I think a person needs to be organized and disciplined. You have to be in the mindset of online classes, you have to be able to do things on your own and be able to motivate yourself to do the work and to study hard. A person needs to be a good planner and to manage his time properly. You have to be able to understand the material or at least have some background in the topic you’re studying. You need to be motivated and you need to be dedicated. It is so critical for the person to be able to work independently. (Participant 5)

Last, two participants noted the need to be good at follow-up and seeking help when needed. Participant 8 noted these invariant constituents – as well as noting a lack of interaction with others in an online environment – which contrasts with the interactive environment described by the successful group participants:

I believe those who are outgoing will not be able to succeed online because there is no one to talk to or interact with, the online environment is very private. A person taking online class have to be willing to ask for seek help when needed, when you can't figure things by yourself you should seek help. You have to be serious and take your study seriously if you want to take online classes, you can't waste time and expect to succeed, you need to stay up-to-date and do your work when they are due. (Participant 8)

Participant 6 had similar comments:

Another thing that is really important is you have to be a person who checks up, and who follows up. In these type of classes the teacher keep asking questions constantly because with these classes I found it was quite a lot harder to ask questions, just because the teacher won't e-mail you back for few days, and your homework was due the next day, so you have to be consistent when you ask questions and you have to follow up to get the answer.

Specific Skills to Promote Success. Unsuccessful group participants offered their perceptions with regard to specific skills that serve to promote success in an online course environment. Key invariant constituents to this category included (a) time management skills, (b) independent learning skills and/or ability to self-teach, (c) technology skills including computer and Internet skills, and (d) reading and writing skills. Table 22 provides the variety of invariant constituents and related frequencies.

Participant 7 stressed the need for time management skills, stating: "You've got to be able to understand what is required in the course, you have to make sure you put down all the due dates and keep those date in your daily planner." Participant 6 focused on the technical skills required for success in online courses:

You have to have great knowledge of the computer, how to work e-mail and the Internet, just technology in general. I am OK with working on computers, I can do basic things but as far as attaching certain document and mailing bigger file just with such class you had to do such things. (Participant 6)

Table 22

Specific Skills Perceived to Promote Success: Unsuccessful Group

Invariant Constituent	No. of Participants Responding
Time management	4
Technology skills (computer skills)	4
Independent learning skills/self-teaching skills	4
Reading/comprehension skills and writing skills: Able to write effectively	3
Ability to stay up to date and never lag behind	2
Understanding of the scope of the class and ability to be realistic for time commitment	2
Able to learn D2L	1
Organization skills	1
Communication skills	1

As with the successful group, reading and writing skills and the ability to teach oneself were noted as being important to success in an online environment. For example, Participant 7 stated: “You have to be able to read well and to understand what you read on your own without anyone explaining things to you.” Participant 6 described the need for independent learning skills:

Self-instruction would be another good thing, I am a person who actually, I found out this later, but I have to be in classroom and have one-on-one contact with the teacher in order to understand. I am a visual person so if something is written I can see it not imagine it in my head, but if it is like on e-mail or something like that it doesn't stick with me, it have to be a person who have a very energetic way of learning like it is written down, you read it and you absorb it so it is cut and narrow. (Participant 6)

Other Perceived Factors Contributing to Online Success. The unsuccessful group noted several other factors that were perceived to contribute to success in an online learning environment. Some of the factors mentioned by interview participants were skills or personality traits and were therefore re-grouped. The majority of the remaining factors lacked more than a single mention, with the exception of the perceived supporting element of learning a teacher's style and communicating well with the teacher, which received two mentions (50%). The single mentioned factors included the following, as perceived by the unsuccessful group:

- Able to ask for help when needed
- Active participation
- Consistency
- Familiarity with subject matter
- General follow-through
- Having a good computer with a broadband Internet connection
- Having a quiet place to study without distraction
- Desire to be in the class
- Being truthful to self

Perceptions of the DISC Instrument. Participants evaluated the DISC personality instrument used in this investigation and provided their opinions and perceptions of the instrument. Invariant constituents (responses) revealed to be most frequent within this category within the unsuccessful student group included the following: The instrument was (a) an accurate assessment of their personality, (b) easy to take and understand, (c) a source of useful and helpful information for understanding oneself and others, and (d) enjoyable to take. Table 23 provides the invariant constituents and related frequencies for this category.

Table 23

Perceptions of the DISC Instrument: Unsuccessful Group

Invariant Constituent	# of participants to offer this response
Accurate	4
Easy to take and understand	3
Useful/helpful information	2
Enjoyed taking/comfortable taking	2
Overall comprehensive	2

As with the successful group participants, the unsuccessful group interview participants demonstrated similarity among participants in their perceptions with regard

to the DISC instrument. Participant 5 mentioned these invariant constituents, for example, when stating:

It was easy to take, it didn't require much time, and I was done in about 10 minutes. I actually enjoyed taking it and was surprised with the result, because it describes me accurately, I actually was laughing when I was reading the result, and I kept saying yes that is me. You know it was overall comprehensive.
(Participant 5)

Cross-Case Analysis

The cross-case analysis was used to examine the data across the two cases, demonstrating common responses among cases (groups) as well as differences. The cross-case analysis allows for overall conclusions to be drawn from the group as a whole. The data represented similarity across the groups, particularly in the perceptions of personality characteristics and specific skills that serve to increase the likelihood for success in an online learning environment. Several differences were also noted. Notable themes in the cross-case analysis, demonstrating similarity between groups, revealed the perceptions of the students as a whole. The common responses resulting from the cross-case analysis and the associated frequencies are provided for each category.

Both groups found teachers to be helpful (six of eight participants) and enjoyed or liked the convenience and flexibility offered by the online environment (five of eight participants). Although the successful group commented on difficulties initially in terms of adjusting to the online environment, the required self-discipline, and learning

the D2L system, this group described becoming more comfortable over time in the online course framework (six of eight participants), whereas the unsuccessful group reported remaining overwhelmed and unable to keep up on the workload, resulting in failure (six of eight participants). This result was the most notable difference in perceptions of the students revealed through the cross-case analysis. The successful group also noted enjoyment of the interactive environment, the availability of others online, and the importance of communication, suggesting the perceived importance of a collaborative learning experience to the successful group. Because these elements were not highlighted within the unsuccessful group, it is possible that these elements could enhance adaptability to the online environment, promoting greater success.

In terms of personality characteristics serving to promote success in an online environment, both successful and unsuccessful groups noted the need for individuals to be focused, disciplined, and responsible (all eight participants), organized (seven of eight participants), determined and/or committed, persistent, hard-working (five of eight participants), motivated (four of eight participants), and independent (four of eight participants). However, the unsuccessful group further delineated the element of motivation to include being self-motivated. The unsuccessful group also perceived that a personality type that tends to follow up and to seek help when needed would be helpful in achieving success in online courses, which was not specifically noted by the successful group.

The two groups demonstrated similarity in perceptions of skills serving to promote success in an online environment. All participants (eight of eight participants) in both groups noted the importance of time management skills and technology skills

(computer and Internet skills) frequently and typically more than once within the context of the interview. In addition, seven of the eight participants (inclusive of both groups) cited the importance of reading and writing skills for success in an online environment. Independent learning skills and the ability to self-teach was noted by six of the respondents (inclusive of both groups). The successful group also notably considered communication skills (six of eight participants) to be an important element in student success in online courses; alternately, in the unsuccessful group the element of communication was mentioned by a single participant and only regarding communication with the teacher.

Finally, both groups described the DISC instrument as easy to take (7 of 8 participants), accurate (seven of eight participants), useful and/or helpful (five of eight participants), and enjoyable (four of eight participants). From the data obtained in the qualitative analysis, the DISC personality instrument was generally perceived by participants as an accurate assessment of the individuals' personalities. This result is critical to demonstrate the validity of the study results.

Qualitative Results and Conclusions

Several conclusions can be drawn from the data. In terms of the within-case analysis, each group (or case) had both similarities as well as differences in high frequency responses, indicating differences in perceptions. Findings resulting from the cross-case analysis of the groups revealed several high frequency perceptions that run

throughout the two groups, representing commonality of perceptions across the groups as well as differences.

Resulting from the cross-case analysis, the following overall themes are presented as relevant conclusions drawn from the data:

- Online courses were perceived by the student interview participants to offer convenience and flexibility in the course and learning environment, and within this framework, teachers are perceived as helpful in the process.
- Although all students may experience difficulty initially adjusting to the demands of an online course, successful students described adapting to the difficulties (i.e., increased time management requirements, computer skills, and D2L framework), and “catching up”; alternately, the unsuccessful students reported an inability to stay up-to-date or “catch up,” resulting in online course failure.
- Collaborative learning within the online learning environment. This is demonstrated by the interactive environment and availability of others, which was enjoyed and noted by the successful group. The importance of online communication skills to success as perceived by the successful group may represent a factor that enhances adaptation to the requirements of the online environment, as these invariant constituents were not highlighted by the unsuccessful group interview participants. Because these elements reflecting collaborative learning were not noted within the unsuccessful group, it is possible that participation in the interactive environment, the availability of others online, and strong online communications skills

(factors that may serve to promote collaborative learning) could enhance adaptability to the online environment, promoting greater success.

- Perceived personality traits that serve to promote success in an online learning environment included individuals who demonstrate a tendency to be focused, disciplined, and responsible; motivated, committed, determined, and persistent; organized; and to efficiently manage their time.
- Specific skills, including time management skills, reading and writing ability, computer and Internet-related technology skills, and independent learning skills, were perceived by all interview respondents to contribute to the likelihood of success in the online environment. In addition, communication skills were perceived to be essential to success among the interview respondents in the successful group.

Summary of Qualitative Analysis

Qualitative analysis of interview data across two sub-groups was completed with the assistance of Nvivo9[®] qualitative analysis software. Results of the analysis were provided that revealed themes generated from high-frequency common responses (invariant constituents) for each group, demonstrating both similarities and differences. In addition, cross-case analysis revealed underlying themes common across both groups (cases).

Summary

A mixed-methods case study was used to examine online student success at a specific institution. The resulting quantitative data suggests a correlation between personality characteristics associated with the IS and possibly DI types (representative of *action* and *collaboration* according to the DISC instrument), although the predictability of these personality types was not demonstrated upon multiple regression. In addition, personality traits of *insistent, demanding* (D Scale); *compelling, inspiring, dynamic* (DI Scale); *cooperative, kind, caring* (IS Scale); *tactful* (S Scale); *modest* (SC Scale); and *critical* and *stern* (DC Scale) demonstrated significance or near significance to success. The results of this study's qualitative analysis suggest that higher level adaptation skills and collaborative learning, through use of interactive environments that provide support and availability of others online and through advanced communication skills, were perceived to be related to success in an online environment. In addition, qualitative analysis revealed the perceived characteristics and skills deemed important to online success by participants. These included focused, disciplined, responsible, motivated, committed, determined, persistent, organized, superior time management skills, and independent learning skills.

Putting the quantitative and qualitative results together suggests significance of collaboration and communication characteristics and skills, such as cooperation skills and/or cooperative personality and communication and people skills as well as skills and/or personality traits associated with achievement or action response (i.e., "getting things done"), such as demonstrated with characteristics of insistent, demanding,

critical. The limited quantitative results identifying near significant predictability of the IS/DI model ($p = .062$) underscore the possible importance of characteristics associated with IS and DI, characteristics of *action* and *collaboration*. In addition, characteristics associated with D (*results-driven*), I (*enthusiasm*), and S (*support*) may be reflected in these results.

The quantitative results – although limited in significance – associating the IS and DI scales (representative primarily of action and collaboration) with success align with the qualitative results in specific ways. These alignments suggest that high-level adaptive skills utilize collaborative learning, which maintains a focus on cooperation and communication skills (collaboration associated with IS). Successful adaptation resulted in continued *action* to keep up and not fall behind in the online environment (action associated with DI). In addition, elements of I, S, and D on the DISC instrument reflect personality characteristics of being results-driven, enthusiasm, and support, elements that also contribute to the importance of collaborative learning in terms of enthusiasm and drive to succeed in an online environment – this also aligns with the qualitative results. The results of the mixed-methods analysis in relation to the research questions are discussed in Chapter 5.

CHAPTER 5

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this mixed-methods study was to examine student personality types using the DISC model of personality assessment and to identify personality types that may be most likely to elicit success in an online learning environment. It has been suggested that personality type can mesh with the demands of an institution and improve the person's level of commitment to that institution (Bamber & Castka, 2006; Reynierse et al., 2000; Bamber & Castka, 2006; Bjorseth, 2004). This study was built on this premise, suggesting it may be possible that personality type may affect the success of students in an online learning environment – which may potentially affect retention and classroom structure.

The DISC instruments were distributed to 50 online business students at a community college in northern Illinois. The quantitative sample consisted of 25 students who had successfully completed at least three online classes and 25 students who had attempted to take two or more online classes and have failed them through low grades, attrition, or failing to meet other benchmarks denoting success as described by the teacher or the college. In addition, eight students were selected with equal representation from both groups to participate in qualitative semi-structured one-on-one interviews.

Chapter 5 provides a review of the findings from Chapter 4 as well as the relation of those findings to previous research. Following this review and discussion of the findings as related to the research questions of the study and the previous literature on the topic, a discussion of the recommendations in terms of the significance of the study – as well as recommendations for further research – is given. The chapter concludes with a brief summary.

Conclusions

The results of the data analysis of quantitative and qualitative measures are provided to attempt to answer the research question of the study: Is there a relationship between a community college student's personality type and his or her success in online courses? Stemming from the first research question, the study also sought to determine whether or not, and to what degree, a community college student's personality type supports his or her online learning experience. The findings are first presented for research question one, from which research question two evolves, followed by a discussion of the overall findings inclusive of the answer to the second research question.

Quantitative Findings

To answer the first research question, multiple analyses were conducted inclusive of cross tabulations and chi-square analysis on demographic data, independent

samples *t*-tests, hierarchical multiple regression with the eight-style characteristics, and standard multiple regression on individual scale items. Overall results do not provide sufficient evidence to suggest a predictive effect of personality style on success; however, a limited effect of specific community college student participants' personality types on student success in online courses was noted. These results are only generalizable to the specific population of community college students in this study. *T*-test results demonstrated a significant relationship between success and the IS scale of the DISC instrument ($p = .05$) and a nearly significant relationship between success and the DI scale ($p = .10$). As seen in Figure 2, these results suggest a small relationship between main personality characteristics of *collaboration* and *action*, characteristics typical of the IS and DI scales.

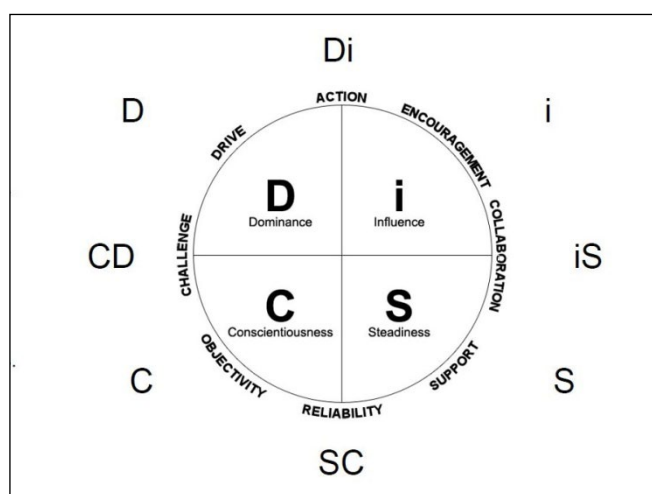


Figure 2. Everything DiSC® Management model.

In addition, according to the DISC Application Research report and facilitator report, the DI and IS characteristics represent a high need for control and a high need for affiliation, respectively. These elements are important when related to the literature. The sense of community acquired within a traditional educational setting has been shown to promote long-term positive associations for the student, which serve to develop a commitment to the community (Cooper, 1990; Dille & Mezack, 1991). These results suggest this idea may be transferable to the online learning community as well, demonstrated by findings that the characteristics related to greater need for affiliation (IS) were related to success within the sample. Similarly, prior research has demonstrated that students with a greater locus of control over the course and the learning environment are more likely to remain active in the educational process (Rotter, 1989), and that this is true even in the online environment (Anderson, 2009; Palloff & Pratt, 2005). Similarly, Dewar and Whittington (2000), using a similar eight-dimension scale (MBTI), found that students who have personality types suited toward factual analysis are better suited towards participation in the online community than those who develop perceptions based on stimuli garnered from social interactions. This is attributed to the relative lack of social interaction associated with distance and/or online learning (Dewar and Whittington, 2000).

Previous research in online education has indicated a majority of females enrolled in online environments (Halsne & Gatta, 2002; Wojciechowski & Palmer, 2005; Zirkle, 2003). This was the case in the present study as well. However, although Wojciechowski and Palmer found no significant relationship between gender and the grade received in the online course, results of the cross tabulations in this study using

success, personality style, and demographics (gender, age, education level, and ethnicity) to assess effects from demographic differences on outcome contradict that finding, revealing a significant effect of demographics of gender (female) on personality style and success.

Hierarchical multiple regression was used to demonstrate predictability among the independent variables (personality style) and success, examining inclusion of each variable in the model one at a time. These relationships were not supported by hierarchical multiple regression; however, the model inclusive of the style interactions (DI, IS, SC, and CD) demonstrated an overall very small effect of 5.4% on the variance of the dependent variable (success) ($R^2 = .054$, $p = .104$), though not significant. Within the hierarchy, the model inclusive of the DI and IS variables provided a near significant result ($R^2 = .112$, $p = .06$), providing limited support for the *t*-test results with an effect of 11.2% on the variance of the dependent variable of success. As such, the result fails to demonstrate predictability of the variables to success but does demonstrate an effect as described. These results were noted to be limited due to the relatively small sample size.

Thus, the overall hierarchical model did not demonstrate significant predictability of success for students in an online environment; however, the model inclusive of only the IS and DI elements demonstrated near significance such that, although the result fails to demonstrate a significant predictability for success among students, the result suggests a strong effect of the independent variables of IS and DI on success, providing support for the *t*-test results. Because multiple regression analysis generally requires a larger sample size (preferably 15 participants per variable), the

small sample size of this study (roughly five participants per variable) may have affected the non-significant result.

Individual item standard multiple regression revealed significant relationships at the $p < .05$ level between success and items of *insistent* (D Scale); *compelling*, *inspiring*, and *dynamic* (DI scale). In relation to the *t*-test and hierarchical regression results, only near significant relationships ($p < .10$) were determined between success and items of *demanding* (D Scale); *cooperative*, *kind*, and *caring* (IS Scale); and *tactful* (S Scale). Again, results were limited by the small sample size.

Quantitative findings, therefore, demonstrate a relationship between certain personality types (IS and DI) of community college students in this study and their success in online courses, although the study failed to provide sufficient evidence to demonstrate predictability of these personality types. Overall, the general concept of personality type (inclusive of all the various DiSC types) did not demonstrate significant predictability nor a significant relationship with success.

Qualitative Findings

Results of the cross-case analysis found both similarities and differences between the two groups (successful and unsuccessful) and served as the overall conclusions of the qualitative analysis. A summary of the themes revealed in the analysis included the following:

1. Perceived convenience and flexibility in the online learning environment with teachers serving as a source of support.

2. Initial difficulties in adjusting to the demands of the online course with successful students describing adaptive responses and unsuccessful students reportedly unable to adapt, resulting in failure.
3. The importance of the collaborative learning environment, demonstrated by interactive aspects of the online experience, the availability of others, and the importance of online communication skills to success, as noted by the successful group and notably absent from the unsuccessful group.
4. Personality traits of focused, disciplined, and responsible; motivated, committed, determined, and persistent; organized; and good at time management were perceived to support success.
5. Specific skills related to time management, reading and writing ability, computer and Internet-related technology skills, and independent learning skill were perceived to support success across groups; alternately, communication skills were noted by successful group participants as essential to success.

Significant within these findings are the suggestions involving the ability to successfully adapt to the online learning environment and the perceived relationship with success. The successful students, who were able to adapt to the online environment, noted the importance of the collaborative learning experience to personal success; this element was not generally noted by the unsuccessful group. This suggests that online communication skills may represent a factor that enhances adaptation to the rigors specific to the online environment, serving to promote success. Prior research has suggested that students who are more familiar with technology are more likely to

succeed in an online course (Long-Goding, 2006; Meredith & Madjidi, 2011; Rudestam & Shuoenholtz-Read, 2009), further suggesting that students who have experience on the Internet and in participation in online communities will more easily manage the requirements of the online classroom. Rudestam and Shuoenholtz-Read (2009) also noted that students who lack more experience within online communities are at risk for disenfranchisement from the class.

Therefore, in answering the second research question, how does a community college student's personality type support his or her success in online courses, the results of both the quantitative and qualitative findings suggest that student characteristic behaviors, rather than simply personality type, although likely related, may be more relevant to community college student success in an online learning environment. There is insufficient evidence to suggest that personality type alone could be used to explore community college success in online courses. The findings indicate that personality type cannot be used to predict online course success. However, certain personality traits or characteristic behaviors or skills may possibly be indicative of a community college student who will succeed in the online environment, but more research is needed to confirm these qualitative findings.

Discussion

Although lacking statistical significance in terms of predictability, the quantitative findings indicate a relationship in terms of effect of the specific personality type scales of IS and DI (primarily descriptive of collaboration/affiliation and

action/control) and success. This is further supported by the qualitative findings in terms of the importance of collaboration, cooperative personality, and communication skills, as well as skills associated with achievement (i.e., action response), as demonstrated by individual item characteristics of *insistent*, *demanding*, and *critical*. Although the limited quantitative findings provide evidence for a relationship between success and personality characteristics associated with the IS and DI scales, only a near significant level of predictability was found.

These particular scales demonstrate personalities associated with collaboration/affiliation and action/control. Because of several overlapping elements within the DISC instrument, characteristics associated with D (results-driven), I (enthusiasm), and S (support) may also be reflected in these results. Therefore, the DISC instrument may not be appropriate for evaluating personality style as it relates to student success in an online environment.

Prior research has demonstrated the importance of affiliation as a significant factor affecting success for online students (Dennen, Darabi, & Smith, 2007). Dennen et al. (2007) found learner satisfaction to be linked to perceived adequacy of interpersonal communication. Affiliation has been shown to affect feelings of belonging, serving to increase the motivation to learn (Chen et al., 2010). Within the online education dimension, the concept of affiliation includes elements of social interaction or isolation, participation in online communication venues, and the overall sense of community (Chen et al., 2010).

This concept ties directly to the qualitative findings of this study, which provide valid results with regard to the experiences and perceptions of the interview participant

sample. The quantitative results, although limited, align with the qualitative findings, providing a degree of support for these findings. Overall, the quantitative and qualitative analyses together suggest the importance of high level adaptive skills supported by individual participation in a collaborative learning environment, which focuses on cooperation and communication skills and serves to maintain action in terms of being able to keep up and not fall behind. These results are consistent with the quantitative findings of the relationship of success with the IS scale reflective of a need for affiliation and collaboration. Research on traditional higher educational settings has demonstrated that development of a sense of community can elicit commitment to the institution (Chen et al., 2010; Cooper, 1990; Dille & Mezack, 1991).

This idea is conceptualized through the student integration model as proposed by Tinto (1994). The student integration model describes *persistence* as a function of two commitments: commitment to complete college and the commitment to the institution (Carbrara, Castaneda, Nora, & Hengstler, 1992; Tinto, 1994). Previous research has demonstrated that in the regular classroom, relationships with others in the classroom have a positive impact on student performance (Dewar & Whittington, 2000). Due to the nature of the online environment, which can be devoid of interpersonal contact, these relationships can prove difficult to form. Individual students with high level communication and cooperation skills may be more likely to successfully navigate the online environment, providing greater opportunity for the formation of relationships.

The relationship between the notion of a collaborative learning environment and success is complex within an online venue. Personality characteristics typically

associated with high levels of communication, such as being extraverted, may not be as relevant in an online setting, where an introverted personality may thrive on the less personal nature of online communication. Thus, an individual who is very shy but nonetheless enjoys personal contact and friendship may exhibit higher levels of communication and participation in an online course environment as opposed to a traditional setting. This notion may require some additional research to identify the level of participation among different personality types in various course delivery modes.

In addition, the associated personality characteristics of *results-driven*, *enthusiasm*, and *support*, which reflect the I, S, and D scales of the instrument, were not shown to be significant in this study despite the overlapping elements with the DI and IS scales. However, these characteristics may contribute to the importance of collaborative learning in the online environment. The sample for this study may have been too small to demonstrate significance in these areas.

Limitations

The study was limited to online learning students from a specific community college in northern Illinois. The sample was drawn solely from the business school student population at this public community college and, therefore, the sample was not necessarily representative of the overall population of online learners. In addition, the quantitative results of the study were limited due to the small sample size. A more generally accepted sample size of 15-per-variable would have produced more reliable

results. In terms of assessing personality, the DISC instrument is a self-report instrument; as a result, it is possible that individual participants' self-perception is actually different than true actions or personality characteristics. Although the instrument is designed to obtain the most valid results possible, the present study remains limited by this aspect.

The data from the qualitative portion of the study was limited by the participants' willingness to answer honestly and openly during the interview process. Therefore, the validity of the qualitative results was limited to the reliability of the information provided by the participants. In an effort to ensure openness and honesty during the interview process, attention was given to provide a comfortable and confidential atmosphere to promote open and honest answers from participants (Moustakas, 1994).

Recommendations

The findings from this study, though lacking in statistical significance, revealed that personality characteristics may support success in an online environment. The themes revealed in the analysis provide the basis for the significance of the study and the significance to leadership. These themes can also be built upon in future research to identify specific characteristics valuable to students attempting to succeed in an online learning environment.

Implications

The online learning environment offers flexibility and convenience that is typically not available through traditional higher education learning settings. The online learning environment can provide for the educational needs of the nontraditional student who may have employment and family obligations, which was confirmed by participants in this study. Demographic characteristics of students have been considered when attempting to predict student success within the online environment; the student's profile is sometimes considered as a component of whether or not that student will be able to successfully engage the learning process within an online environment (Guernsey, 1998; Mariani, 2001). Given the persistent retention issues among the online learning population, the results of the study can be used to provide needed support where and when it is essential to the development of successful students within the online format. Strategies designed to promote retention with a focus on promoting communication and collaborative learning can be implemented to support student success.

The results of the present study suggest the importance of high-level adaptive skills supported by individual participation in a collaborative learning environment, focusing on cooperation and communication skills and serving to maintain action within the course (being able to "keep up") through qualitative data analysis as well as the relationship of success with the IS scale reflective of a need for affiliation and collaboration through quantitative analyses. As such, and combined with prior research

on traditional higher educational settings that have demonstrated that development of a sense of community can elicit commitment to the institution (Chen et al., 2010; Cooper, 1990; Dille & Mezack, 1991), results suggest the potential benefits of student technology support for students new to the online modality as well as increased levels of collaborative learning and communication. These particular elements could be implemented as part of the required curriculum for online courses. It is recommended that educational leadership use these results to potentially support improvement in student success in an online environment. Improved strategies to promote success and retention would facilitate positive effects on individual student outcomes as well as the reputation and profitability of the institution.

Recommendations for Future Research

Several elements of this study served to limit the results, highlighting the need for further research in this area. As previously noted, the associated personality characteristics *results-driven*, *enthusiasm*, and *support*, reflective of the I, S, and D scales of the DISC instrument, were not shown to be significant in this study despite the overlapping elements with the DI and IS scales. The sample for this study may have been too small to demonstrate significance in these areas. Therefore, a similar quantitative study using a significantly larger sample size could improve results, particularly in terms of the multiple regression analysis, and may serve to reveal if these characteristics may contribute to the importance of collaborative learning in the online environment.

Findings on the effect of gender on personality style and success in the online environment among study participants contrasted with the previous research (Wojciechowski & Palmer, 2005). However, the results corroborated prior research indicating a higher percentage of females enrolled in online courses in this study (Halsne & Gatta, 2002; Wojciechowski & Palmer, 2005; Zirkle, 2003). Therefore, a study focusing on the specific effects of gender on online performance should be explored.

In addition, because the qualitative results suggest possible characteristic behaviors or skills that may promote success in an online venue, more research is needed to reveal whether this perception is statistically significant to student success. Personality types could also be examined in terms of a relationship with the level of participation and/or communication of individuals in the class, which may more accurately identify personality types that excel in communications specific to the online versus traditional settings. Perhaps certain personality types are more communicative within a more anonymous online setting as opposed to face-to-face contact. In addition, a qualitative exploration of the perceptions of online students with specific interest in communication and collaboration and sense of affiliation achieved within the course would provide insight into how increased levels of these elements can be effectively achieved. Elements shown to enhance students' affiliation, commitment, and engagement with the institution in a traditional environment may or may not be transferable to the online environment. Research on these elements would build on the findings of this study and potentially positively affect retention and student outcomes within online learning environments.

Summary

This mixed-methods study examined the relationship between personality type and success in online courses. The results indicated a small relationship between characteristics of *collaboration* and *affiliation* with success in an online environment. A possible relationship between characteristics of *action* and *control* is also suggested. Student integration theory (Tinto, 1994) posits that student commitment is reflected in success in terms of student persistence. Qualitative findings suggest the benefits of online communication skills in adapting to the requirements of online courses. Students who were not able to adapt to the online environment were not successful; alternately, those who demonstrated use of the available communication methods and were able to incorporate the use of technology to facilitate a collaborative learning environment were perceived to be more successful. Elements of enhanced communication and engagement within a collaborative learning environment would serve to support a commitment, as suggested by Tinto (1994), through a greater level of affiliation and sense of belonging.

Results suggest the need for additional research with regard to personality type as it relates to the various responses and actions taken within the unique circumstances of online communication and collaboration for purposes of learning. Research designed to identify and understand mechanisms that would serve to increase student engagement and affiliation with the institution may serve to further promote online student success.

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APPENDIX A
SUPPLEMENTAL STATISTICS TABLES

Table 24(A)
4 Style DISC Model Hierarchical Regression Coefficients^a Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	.489	.074		6.592	.000					
D	-.089	.177	-.137	-.502	.618	-.146	-.075	-.073	.287	3.485
I	-.095	.217	-.133	-.436	.665	.098	-.065	-.064	.230	4.353
S	.019	.052	.097	.371	.713	.093	.055	.054	.312	3.210
C	-.161	.187	-.250	-.863	.393	-.095	-.128	-.126	.254	3.944

a. Dependent Variable: success

Table 24(B)
Descriptive Statistics

	Mean	Std. Deviation	N
success	.50	.505	50
D	-.030396	.7775986	50
I	.117265	.7100338	50
S	-.040094	2.5388396	50
C	-.122545	.7830416	50

Table 24(C)
Correlations

	success	D	I	S	C
Correlation	1.000	-.146	.098	.093	-.095
Pearson					
success		1.000	-.364	-.693	-.039
D			1.000	-.148	-.779
I				1.000	.472
S					1.000
C					

Table 25(A)
4 Style Interaction Construct Hierarchical Regression Model No.2 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta				Zero-order	Partial	Part	Tolerance	VIF
2 (Constant)	.543	.075			7.284	.000					
DI	-.212	.206	-.209		-1.029	.309	-.233	-.152	-.143	.469	2.130
IS	.402	.262	.378		1.536	.132	.275	.223	.214	.320	3.123
SC	-.059	.206	-.056		-.284	.778	.044	-.042	-.039	.490	2.039
CD	.163	.207	.184		.788	.435	-.108	.117	.110	.353	2.831

a. Dependent Variable: success

Table 25(B)

Descriptive Statistics

	Mean	Std. Deviation	N
success	.50	.505	50
DI	.046331	.4973186	50
IS	-.047089	.4743012	50
SC	-.002862	.4857954	50
CD	-.088684	.5696909	50

Table 25(C)

Correlations

	success	DI	IS	SC	CD
Pearson Correlation	1.000	-.233	.275	.044	-.108
success	1.000	-.233	.275	.044	-.108
DI	-.233	1.000	-.163	-.645	.008
IS	.275	-.163	1.000	-.093	-.771
SC	.044	-.645	-.093	1.000	.007
CD	-.108	.008	-.771	.007	1.000
CD	50	50	50	50	50

Table 26

Individual Item Correlations Using Standard Multiple Regression Analysis

Model	Sig. 1-tailed	Coefficients		Tolerance
	p	B	p	
D Scale				
Demanding	.04	.143	.47	.499
Forceful	.40	.159	.39	.583
Persistent	.44	.097	.55	.746
Blunt	.40	-.123	.53	.507
Direct	.25	.378	.08	.428
Firm	.03	-.249	.19	.563
Insistent	.008	-.365	.07	.507
Strong-willed	.45	-.011	.96	.494
Frank	.41	-.007	.98	.458
dominant	.11	-.014	.94	.630
DI Scale				
magnetic	.203	-.155	.433	.469
adventurous	.447	.336	.109	.426
compelling	.007	-.247	.128	.710
inspiring	.005	-.253	.211	.454
bold	.446	.339	.068	.548
daring	.102	-.216	.326	.378
dynamic	.015	-.298	.202	.341
stimulating	.253	.082	.647	.562
gutsy	.157	-.137	.527	.387
captivating	.195	.198	.352	.407
I Scale				
outgoing	.079	-.226	.272	.540
lively	.351	.003	.989	.519
joyful	.432	.095	.710	.351
optimistic	.441	-.026	.908	.442
playful	.315	.105	.615	.519
enthusiastic	.432	-.021	.927	.411
full-of-life	.500	.273	.316	.310
high-spirited	.088	-.393	.094	.425
talkative	.405	.089	.695	.443
sociable	.381	-.036	.881	.401
IS Scale				
cheerful	.351	-.167	.281	.771
supportive	.188	.144	.434	.543
trusting	.282	.028	.861	.692
receptive	.188	-.355	.053	.568
cooperative	.042	-.353	.031	.720
agreeable	.108	.233	.200	.562
warm	.092	.116	.590	.393
good-natured	.294	.023	.910	.463
kind	.040	.119	.686	.212
caring	.052	.182	.482	.274

Model	Sig. 1-tailed	Coefficients		Tolerance
	p	B	p	
S Scale				
humble	.216	-.195	.290	.655
calm	.219	-.055	.812	.413
accepting	.309	.164	.355	.708
gentle	.444	.074	.686	.652
patient	.500	-.147	.572	.326
even-tempered	.246	.279	.202	.468
soft-hearted	.449	-.131	.468	.682
tactful	.048	.327	.074	.683
accommodating	.381	-.135	.521	.496
serene	.205	-.086	.645	.628
SC Scale				
careful	.434	-.082	.677	.546
soft-spoken	.103	-.350	.175	.328
unassertive	.118	-.097	.624	.548
quiet	.356	.045	.842	.411
cautious	.273	.300	.175	.446
passive	.500	.134	.523	.486
conforming	.446	.095	.604	.632
conventional	.435	-.014	.936	.716
self-controlled	.356	-.110	.541	.664
restrained	.133	-.162	.372	.658
modest	.045	.255	.152	.688
C Scale				
methodical	.433	.041	.845	.534
introverted	.137	-.037	.856	.559
meticulous	.211	-.114	.617	.461
solitary	.188	.024	.909	.534
unemotional	.275	-.069	.701	.752
reserved	.067	-.203	.312	.600
perfectionistic	.378	.008	.969	.556
logical	.245	-.132	.512	.601
systematic	.391	.034	.877	.505
analytical	.295	.001	.996	.598
DC Scale				
skeptical	.295	-.008	.968	.571
strict	.156	.036	.852	.555
stubborn	.124	-.173	.292	.785
stern	.049	-.185	.325	.599
untrusting	.207	-.037	.836	.670
cynical	.444	.154	.434	.547
questioning	.353	.175	.298	.745
critical	.025	-.271	.184	.515

Table 27(A)

Standard Multiple Regression for Demographic Inference to Style C, ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1					
Regression	7.298	3	2.433	4.317	.009 ^a
Residual	25.922	46	.564		
Total	33.220	49			

a. Predictors: (Constant), race/ethnicity, gender, age; b. Dependent Variable: C

Table 27(B)

Standard Multiple Regression for Demographic Inference to Style C, Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
1										
(Constant)	2.888	.258		11.174	.000					
gender	.358	.236	.201	1.518	.136	.262	.218	.198	.967	1.034
age	.305	.107	.383	2.865	.006	.420	.389	.373	.949	1.054
race/ethnicity	.030	.097	.041	.311	.758	.143	.046	.040	.951	1.052

a. Dependent Variable: C

Table 27(C)

Standard Multiple Regression for Demographic Inference to Style C, Descriptive Statistics

	Mean	Std. Deviation	N
C			
gender	3.66	.823	50
age	.70	.463	50
race/ethnicity	1.56	1.033	50
	1.50	1.129	50

Table 27(D)

Standard Multiple Regression for Demographic Inference to Style C, Correlations

	C			
Pearson Correlation	C	gender	age	race/ethnicity
	1.000	.262	.420	.143
	.262	1.000	.145	.137
	.420	.145	1.000	.192
	.143	.137	.192	1.000

Table 28(A)

Standard Multiple Regression for Demographic Inference to Style CD, ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2.029	3	.676	2.242	.096 ^a
Residual	13.874	46	.302		
Total	15.903	49			

a. Predictors: (Constant), race/ethnicity, gender, age; b. Dependent Variable: CD

Table 28(B)

Standard Multiple Regression for Demographic Inference to Style CD, Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
(Constant)	-.023	.189		-.122	.903					
gender	-.401	.172	-.326	-2.329	.024	-.289	-.325	-.321	.967	1.034
age	.103	.078	.187	1.319	.194	.153	.191	.182	.949	1.054
race/ethnicity	.037	.071	.073	.515	.609	.064	.076	.071	.951	1.052

a. Dependent Variable: CD

Table 28(C)

Standard Multiple Regression for Demographic Inference to Style CD, Descriptive Statistics

	Mean	Std. Deviation	N
CD	-.088692	.5696936	50
gender	.70	.463	50
age	1.56	1.033	50
Race/ethnicity	1.50	1.129	50

Table 28(D)

Standard Multiple Regression for Demographic Inference to Style CD, Correlations

	CD	gender	age	race/ethnicity
Pearson Correlation	1.000	-.289	.153	.064
		1.000	.145	.137
			1.000	.192
				1.000

Table 29(A)

Standard Multiple Regression for Demographics Inference to Style D, ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1	9.999	3	3.333	2.899	.045 ^a
Residual	52.881	46	1.150		
Total	62.880	49			

a. Predictors: (Constant), race/ethnicity, gender, age; b. Dependent Variable: D

Table 29(B)

Standard Multiple Regression for Demographics Inference to Style D, Coefficients^a

Model	Unstandardized Coefficients		t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error			Zero-order	Partial	Part	Tolerance	VIF
1									
(Constant)	2.819	.369	7.637	.000					
gender	-.732	.337	-2.174	.035	-.265	-.305	-.294	.967	1.034
age	-.056	.152	-.368	.715	-.036	-.054	-.050	.949	1.054
race/ethnicity	.307	.139	2.206	.032	.255	.309	.298	.951	1.052

a. Dependent Variable: D

Table 29(C)

Standard Multiple Regression for Demographics Inference to

Style D, Descriptive Statistics

	Mean	Std. Deviation	N
D	2.68	1.133	50
gender	.70	.463	50
age	1.56	1.033	50
race/ethnicity	1.50	1.129	50

Table 29(D)

Standard Multiple Regression for Demographics Inference to

Style D, Correlations

	D	gender	age	race/ethnicity
Pearson Correlation	1.000	-.265	-.036	.255
		1.000	.145	.137
			1.000	.192
				1.000

Table 30(A)
Standard Multiple Regression for Demographic Inference to Style DI, ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1					
Regression	2.856	3	.952	4.727	.006 ^a
Residual	9.263	46	.201		
Total	12.119	49			

a. Predictors: (Constant), race/ethnicity, gender, age; b. Dependent Variable: DI

Table 30(B)
Standard Multiple Regression for Demographic Inference to Style DI, Coefficients^a

Model	Unstandardized Coefficients		Std. Error	t	Sig.	Correlations			Collinearity Statistics	
	B	Beta				Zero-order	Partial	Part	Tolerance	VIF
1										
(Constant)	.530		.154	3.427	.001					
gender	-.081	-.075	.141	-.575	.568	-.160	-.084	-.074	.967	1.034
age	-.168	-.348	.064	-2.632	.012	-.407	-.362	-.339	.949	1.054
race/ethnicity	-.110	-.250	.058	-1.889	.065	-.327	-.268	-.244	.951	1.052

a. Dependent Variable: DI

Table 30(C)
Standard Multiple Regression for Demographic Inference to Style DI, Descriptive Statistics

	Mean	Std. Deviation	N
DI	.046337	.4973173	50
gender	.70	.463	50
age	1.56	1.033	50
race/ethnicity	1.50	1.129	50

Table 30(D)
Standard Multiple Regression for Demographic Inference to Style DI, Correlations

	DI	gender	age	race/ethnicity
Pearson Correlation	1.000	-.160	-.407	-.327
		1.000	.145	.137
			1.000	.192
				1.000

Table 31(A)

Standard Multiple Regression for Demographic Inference to Style I, ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1					
Regression	13.936	3	4.645	6.143	.001 ^a
Residual	34.784	46	.756		
Total	48.720	49			

a. Predictors: (Constant), race/ethnicity, gender, age; b. Dependent Variable: I

Table 31(B)

Standard Multiple Regression for Demographic Inference to Style I, Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
1										
(Constant)	4.227	.299		14.120	.000					
gender	.268	.273	.125	.983	.331	.071	.143	.122	.967	1.034
age	-.519	.123	-.538	-4.204	.000	-.486	-.527	-.524	.949	1.054
race/ethnicity	.156	.113	.177	1.386	.173	.091	.200	.173	.951	1.052

a. Dependent Variable: I

Table 31(C)

Standard Multiple Regression for Demographic Inference to Style I, Descriptive Statistics

	Mean	Std. Deviation	N
1			
gender	3.84	.997	50
age	.70	.463	50
race/ethnicity	1.56	1.033	50
	1.50	1.129	50

Table 31(D)

Standard Multiple Regression for Demographic Inference to Style I, Correlations

	I	gender	age	race/ethnicity
1				
Pearson Correlation	1.000	.071	-.486	.091
	.071	1.000	.145	.137
	-.486	.145	1.000	.192
	.091	.137	.192	1.000

Table 32(A)
Standard Multiple Regression for Demographic Inference to Style IS, ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1					
Regression	1.579	3	.526	2.564	.066 ^a
Residual	9.444	46	.205		
Total	11.023	49			

a. Predictors: (Constant), race/ethnicity, gender, age; b. Dependent Variable: IS

Table 32(B)
Standard Multiple Regression for Demographic Inference to Style IS, Coefficients^a

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	Correlations		Collinearity Statistics	
	B	Beta			Zero-order	Partial	Tolerance	VIF
1								
(Constant)	-.246		-1.580	.121				
gender	.393	.384	2.767	.008	.368	.378	.967	1.034
age	-.034	-.075	-.533	.597	-.026	-.078	.949	1.054
race/ethnicity	-.015	-.036	-.257	.798	.002	-.038	.951	1.052

a. Dependent Variable: IS

Table 32(C)
Standard Multiple Regression for Demographic Inference to Style IS, Descriptive Statistics

	Mean	Std. Deviation	N
IS	-.047095	.4743018	50
gender	.70	.463	50
age	1.56	1.033	50
race/ethnicity	1.50	1.129	50

Table 32(D)
Standard Multiple Regression for Demographic Inference to Style IS, Correlations

	IS	gender	age	race/ethnicity
Pearson Correlation	1.000	.368	-.026	.002
		1.000	.145	.137
			1.000	.192
				1.000

Table 33(A)

Standard Multiple Regression for Demographic Inference to Style S, ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1					
Regression	4.302	3	1.434	1.925	.139 ^a
Residual	34.278	46	.745		
Total	38.580	49			

a. Predictors: (Constant), race/ethnicity, gender, age; b. Dependent Variable: S

Table 33(B)

Standard Multiple Regression for Demographic Inference to Style S, Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
1										
(Constant)	3.312	.297		11.144	.000					
gender	.632	.271	.330	2.334	.024	.333	.325	.324	.967	1.034
age	-.004	.123	-.005	-.035	.972	.048	-.005	-.005	.949	1.054
race/ethnicity	.021	.112	.027	.191	.850	.071	.028	.026	.951	1.052

a. Dependent Variable: S

Table 33(C)

Standard Multiple Regression for Demographic Inference to Style S, Coefficients^a

	Mean	Std. Deviation	N
S	3.78	.887	50
gender	.70	.463	50
age	1.56	1.033	50
race/ethnicity	1.50	1.129	50

Table 33(D)

Standard Multiple Regression for Demographic Inference to Style S, Correlations

	S	gender	age	race/ethnicity
Pearson Correlation	1.000	.333	.048	.071
gender	.333	1.000	.145	.137
age	.048	.145	1.000	.192
race/ethnicity	.071	.137	.192	1.000

Table 34(A)
Standard Multiple Regression for Demographic Inference to Style SC, ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1					
Regression	.622	3	.207	.871	.463 ^a
Residual	10.943	46	.238		
Total	11.564	49			

a. Predictors: (Constant), race/ethnicity, gender, age; b. Dependent Variable: SC

Table 34(B)
Standard Multiple Regression for Demographic Inference to Style SC, Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
1										
(Constant)	-.206	.168		-1.224	.227					
gender	-.003	.153	-.003	-.021	.983	.039	-.003		.967	1.034
age	.062	.069	.132	.896	.375	.164	.131		.949	1.054
race/ethnicity	.072	.063	.168	1.139	.261	.192	.166	.163	.951	1.052

a. Dependent Variable: SC

Table 34(C)
Standard Multiple Regression for Demographic Inference to Style SC, Descriptive Statistics

Table 34(D)
Standard Multiple Regression for Demographic Inference to Style SC, Correlations

	Mean	Std. Deviation	N
SC	-.002861	.4858006	50
gender	.70	.463	50
age	1.56	1.033	50
race/ethnicity	1.50	1.129	50

	SC	gender	age	race/ethnicity
Pearson Correlation	1.000	.039	.164	.192
		1.000	.145	.137
			1.000	.192
				1.000

APPENDIX B

IRB APPROVAL LETTERS

APPLICATION FOR INSTITUTIONAL REVIEW OF RESEARCH
INVOLVING HUMAN SUBJECTS

Note: Please complete this form and provide brief responses to the issues raised, keeping in mind that the primary concern is the potential risk, (economic, ethical, legal, physical, political, psychological/emotional, social, breach of confidentiality, or other), to the subjects. Provide copies of all stories, questionnaires, interview questions, recruiting materials, or other documents to be used in the investigation. The Institutional Review Board (IRB) must have enough information about the transactions with the subjects to evaluate the risks of participation. Assurance from the investigator that subjects are at no risk, no matter how strong, will not substitute for a description of the transactions.

Name(s) and employee ID for faculty, Z-ID for students:

Status:

☐ Faculty ☒ Graduate Student ☐ Undergraduate Student

Department:

Educational Technology, Research and Assessment (ETRA)

Mailing Address (if not department):

Phone:

E-mail:

mchahino@yahoo.com

Project Title:

An exploration of the relationship between students taking online classes and their personality types

Data Collection Start Date:

☒ Upon IRB approval ☐ Other
 (specify):

Note: Unless the authorized departmental reviewer (e.g., chair or designee) has deemed on the screening form that IRB review is not needed, all projects must receive formal written clearance from the IRB Chair (or an IRB member designated by the Chair) **prior** to the start of data collection.

Type of Project (Check one)

☐ Externally Sponsored Research

A complete copy of the grant proposal or contract must accompany this application form for IRB review to take place.

- Source of Funding:

- Title of grant proposal (if different from IRB protocol):

- Name of principal investigator on grant proposal:

- Office of Sponsored Projects file number (Note: this is not the grant number):

OSP#

☐ Departmental Research

☐ Graduate School Fund

☒ Thesis/Dissertation (IRB application should be submitted AFTER proposal defense)

Advisor/Committee Chair (& e-mail): Dr. Lara Luetkehans; luetke@niu.edu

☐ Other

Specify:

FOR ALL PROJECTS

1. Briefly provide, in nontechnical, lay-terms (for reviewers outside your area), the following information:
 - a) Describe the purpose of your study and the reason(s) this study is needed. Include a description of your hypothesis or research question.

The purpose of this study is to explore students' personality types using the DISC model of personality assessment and isolate which personality types are most likely to succeed in online courses. The DISC model is based on William Marston's theory of personality type and has been independently validated as a viable tool in identifying personality traits. The setting for this study is the business department of a community college in northern Illinois; the setting was selected as the site for the study as it is local to the researcher and the institution places a strong focus on its online learning department. As student success are directly related to retention, this study would facilitate the inception of strategies designed to retain those students who may leave the online university. As student success and retention play a key role in institution's reputation and profitability, improved retention strategies would facilitate positive long-term planning and progress for all participants.

The research project will answer the following questions:

- 1) Is there a relationship between community college students' personality type and their success in online courses?
- 2) How can personality type be used to explore community college students' success in online courses?

- b) Explain precisely the procedures of the study (what will your subjects be asked to do, provide, answer, etc.?).

The case study method as used in the proposed research study takes place in two parts. The first is the administration of the DISC survey to 70 online business students at a northern Illinois community college, 35 of which have successfully completed at least three online classes and the other 35 are those who attempted to take two or more online classes and have failed them through low grades, attrition, or failing to meet other benchmarks denoting success as described by the teacher or the college.

The second part of the study is done through conducting semi-structured one-on-one interviews with students from both groups. The semi-structured interviews are guided by questions derived from the literature on online learning and the needs of students; each interview will take 20 to 30 minutes to complete. All students who participated in the first part of the research study will be given the opportunity to participate in the semi-structured interviews, although some attrition from the study is expected. A minimum of 4 participants from each group where each participant represents a different quadrant of the four quadrants DISC model are required to ensure that the results come from a sufficient-sized population to withstand challenges to validity and ensure that there is sufficient data for analysis.

- c) Attach copies of all questionnaires, surveys, interview questions, listing of all information/data to be collected, etc. If the research involves an oral interview or focus group discussion that could evolve as it progresses, include a list of discussion topics and any "starter" questions for each topic that can reasonably be expected to be covered. If a *draft* of a written questionnaire or survey is attached, it should be clearly labeled as such and a final version must be submitted *before* data collection begins.

2. Risk/Benefit assessment: Explain the following:

- a) The knowledge/benefit(s) to be gained from the study;

The proposed study would explore the value of "personality type" in relation to student learning and success in online courses. It would help to further understand the different techniques used by instructional technologists to design instructions based on personality types, and to facilitate various ways to improve student success in an online environment. And, as online student success are also directly related to retention, this would facilitate the inception of strategies designed to retain those students who may leave the online university. As student success and retention play a key role in institution's reputation and profitability, improved retention strategies would facilitate positive long-term planning and progress for all participants.

- b) The benefit(s) to the subject(s) (if any) from the proposed research;

The subjects will be given the results of their personality type assessment in a print format and/or electronic format, and will be given a two movie tickets that are good for one year from the date they complete the DISC assessment.

c) Any potential risks (economic, ethical, legal, physical, political, psychological/emotional, social, breach of confidentiality, or other) to the subjects posed by the proposed research. (Note: Some studies may have “no reasonably foreseeable risks.” It is the content of the questions asked and answered, not the risk of completing a questionnaire, etc., that must be considered in describing risk. Investigators are required to report all unexpected and/or adverse events to the IRB. Incidents that have not been listed as anticipated risks are considered protocol deviations and NIU may be required to report them at the federal level.

No reasonably foreseeable risks.

d) What procedures will be used to minimize each risk and/or deal with the challenge(s) stated in “c” above.

None

e) How the potential benefits of the study *justify* the potential risks to the subjects.

No foreseeable potential risk, but some of their time is required.

3. Provide the following information about the study participants:

a) Participant demographics:

- Gender: M ☐ F ☐ Both ☒
- Are any subjects under age 18? Yes ☐ No ☒
- Estimated age(s):

20 - 55

- **Potentially vulnerable populations** (please indicate if any of the following groups are the **target population of the study**)

- ☐ Pregnant women & fetuses
- ☐ Prisoners
- ☐ Decisionally impaired/mentally disabled
- ☐ Specific ethnic group(s) (list in box):

None

If any potentially “vulnerable populations” have been indicated above, please explain the necessity for using this particular group, or if specific groups are excluded from the study, please indicate the exclusion criteria used.

None

- Target number of participants in the **entire study** (including controls) from start to finish (keep in mind that this is just an **estimate of the total**):

70

b) Explain in detail how and where subjects will be recruited or introduced to the study.

Participants for the assessment will be recruited through coordination with the college’s Associate Dean of Instructional Improvement & Distance Learning and faculty members who teach online courses. The recruitment will be made from the college’s department of business. To recruit the 35 successful online students, online faculty members will be asked to announce the research projects to their students and ask for volunteers who meet the requirements, and then the researcher will contact them and invite them to participate in the research. As for the other 35 students who attempted to take two or more online classes and have failed them, the college’s Associate Dean of Instructional Improvement & Distance Learning will assist in identifying a pool of candidates, then he will contact them and will provide them with the researcher contact information to contact him if they are interested in participating in the research.

c) Attach all subject recruitment/introductory materials (advertisements, mailings, fliers, Internet postings, etc.) to be used in the study.

4. Describe the procedures for obtaining informed consent, assent, and/or parental permission (e.g., verbal explanation of study, forms, debriefing).

Once the identified participants have agreed to participate in the research project and have contacted the researcher, they will be approached by him via email and/or face to face meeting to further discuss the research project and to have them sign the Informed Consent Form.

- Append any form(s) to be used. Appropriate informed consent documents should be prepared for each group of subjects participating in the study. Consent forms should be prepared for adult participants (age 18 or over). Assent forms should be prepared for minor subjects appropriate to their ages, and permission form(s) for parents or legally authorized representatives should also be prepared. For children too young to comprehend a simple explanation of participation, parental permission is sufficient only if the research will provide direct benefit to the subject, a member of the subject's family, or other children with the same condition as the subject.
- For projects requiring Subcommittee or Full-board Review, if requesting a waiver of the requirement for obtaining the written informed consent of research participants, justification for the requested waiver is required. Complete and attach the "Request for Variation/Waiver of Consent" form.

5. Does this study involve deception? Yes ☐ No ☒

- Describe the deception and why it is necessary and attach a copy of the debriefing statement.

None

6. Explain what, if any, support services will be provided in the event of harm to a subject (a resource list for the DeKalb area is available on the ORC website).

None

7. Confidentiality:

- a) Describe precautions to insure the privacy of the subjects, and the confidentiality of the data, both in your possession and in reports and publications. Please keep in mind that **confidentiality** refers to ensuring that the knowledge of the identities of the participants will not be shared with others, and **anonymity** refers to no connection between the data and the identities of the participants even through a separate coded list of names.

All data collected from participants will be saved on a private computer to which only the facilitator has access. All consent forms collected will be saved in a lock box along with the audiotapes. Subjects' identifiable information will not be shared with others and will not be mentioned in any report or publication.

- b) Will audio, video, or film recording be used? Yes ☒ No ☐

If yes:

- i. Specify the recording format to be used.

Audiotape recorder will be used when conducting one-on-one interviews.

- ii. **Please keep in mind that specific consent must be sought in the informed consent document(s) by including a separate signature/date line giving consent for recording.** This is in addition to the signature/date line giving consent to participate in the research project.

- c) How will the records (data and recordings) be stored and/or disposed when the research is completed?

All one-on-one interviews will initially be recorded on audiotapes. The facilitator will keep the tapes in a lock-box until they are fully transcribed. Once they have been transcribed, the tapes will be destroyed and thrown away. The transcribed one-on-one discussions along with the raw data collected by DISC instrument will be saved on a private computer to which only the facilitator has access. Once the study has been completed, all transcriptions and raw data will be held in a lock box along with the individual consent forms and will be kept for five years then they will be destroyed and thrown away. The identifiable information that will be collected by inscape publishing and saved on their servers will be completely deleted once the raw data is sent to the researcher.

8. State the research qualifications of the individuals who will have direct contact with the subjects.

- a) In addition to listing the investigators' names, indicate their qualifications to conduct procedures to be used in this study.

Michael Chahino, a doctoral student.

- b) List the Human Subjects Protection training program(s) completed by the individuals listed in 8a and the date(s) of completion. Indicate any workshops, courses, tutorials, or other educational experiences attended, at NIU or elsewhere, which have covered issues relevant to human subject research. (*Note: NIU*

Policy requires that research investigators must complete appropriate training before conducting human subject research.)

<p>I have completed ETR 620 (Educational Research Planning and Interpretation) during which I have completed an online human subject protection training. Also, my dissertation co-chairs have completed annual refresher.</p>
--

REQUIRED SIGNATURES: ALL PROJECTS

CERTIFICATION

I certify that I have read and understand the policies and procedures for research projects that involve human subjects and that I intend to comply with Northern Illinois University Policy. Any changes in the approved protocol will be submitted to the IRB for written approval prior to those changes being put into practice unless it involves an immediate safety issue for the subject during a procedure. (In such instances, the researcher is required to promptly notify the IRB after the fact.) I also understand that all non-exempt projects require review at least annually.

Investigator(s) Signature(s)

Date

Signature of Faculty Advisor
(Student Project Only)

Date

To be completed by investigator and confirmed by advisor (if student project) and departmental reviewer. Initials indicate all required parties ratify that application is complete:

Checklist of items required to accompany completed application form:

1. _____ Complete grant proposal/contract (for externally funded projects)
2. _____ All surveys, questionnaires, interview questions, or other instruments to be used
3. _____ Subject recruitment/introductory materials
4. _____ Informed consent documents (must select at least one):
 - _____ Consent form for adults (if participants are age 18 or over)
 - _____ Assent form for minors (if participants are under age 18)
 - _____ Parental permission form (if participants are under age 18)
 - _____ Waiver of written consent requested (for Subcommittee and Full-board Review projects, must complete and attach *Request for Variation of Consent Attachment* form in order to provide justification that requested waiver meets criteria listed in 45 CFR 46.116(c) or 45 CFR 46.117(c))

Initial indicating all listed materials are attached and application is complete; INCOMPLETE APPLICATIONS WILL NOT BE PROCESSED. The investigator will be notified of deficiencies in the application via e-mail from the Office of Research Compliance (ORC); if no response is received by the ORC within five (5) working days the application will be considered void.

Investigator _____ Advisor (if student project) _____ Department Chair/Designee _____

Departmental Determination according to 45 Code of Federal Regulations 46: (to be completed by Department Chair or Designee)

☐ Project qualifies for Administrative Review.

Cite the appropriate exempt category:

☐ Project qualifies for Subcommittee Review.

Cite the appropriate expedited category:

☐ Project is referred for review by the convened IRB.

Signature of Authorized Departmental Reviewer Date

Please print ADR's name

Return this form, together with necessary documentation, to the Office of Research Compliance, Lowden Hall, 301. For information or additional assistance with the approval process, please call the office at (815) 753-8588 or access the ORC web page at www.grad.niu.edu/orc.

APPENDIX C

RECRUITMENT AND COVER COMMUNICATIONS

December 16, 2009

Dear Elgin Community College Student:

You are invited to participate in a research study on “An exploration of the relationship between students taking online classes and their personality types” being conducted by Michael Chahino, a graduate student at Northern Illinois University. Elgin Community College's Associate Dean of Instructional Improvement & Distance Learning is reaching out to all students who have attempted to take at least two online courses.

In phase one of this two phase study you will be asked to do the following:

First, take a web-based DISC personality assessment (15 to 20 minutes). The DISC personality assessment is an information gathering tool used to determine your personality type and provide demographic information such as your gender, age, and employment status. At the end of the assessment you will be given the option to print and/or save your assessment results in an electronic format.

Some students may be asked to participate in Phase two.

Phase two will consist of a face-to-face interview (20 to 30 minutes) in which you will be asked questions about the DISC personality assessment and your experience in Elgin Community College online classes.

As a token of the researcher's appreciation for your participation in this study and upon receipt of your completed assessment questionnaire, he will mail you two movie tickets that are good for one year from the time you complete the assessment.

Your answers will be completely confidential and your name will not be used in any publication or report.

If you decide to participate in this study you will be asked to sign a consent form for each phase. You will be asked to permit the researcher to compare your grade in your online course with the result of the personality assessment. If you complete phase one of the study, you are not obligated to participate in Phase II. You are also free to withdraw from phase two if you initially agree to participate in phase two and later change your mind. If interested in participating or have any question, you can contact the researcher at (630) 660-1909 or mchahino@yahoo.com. You may also contact the dissertation chair, Dr. Lara Luetkehans at (815) 753-9339 or luetke@niu.edu

Sincerely,

Tim Moore / Associate Dean of Instructional Improvement & Distance Learning

Letter / E-mail to Participants

[Date]

Michael Chahino

[REDACTED]

Geneva, IL 60134

Dear [student name]:

Thank you for agreeing to participate in this study. I appreciate your willingness to take the web-based DISC personality assessment and possibly participate in a face-to-face interview. As a token of my appreciation for your participation in this study and upon receipt of your completed assessment questionnaire, I will mail you two movie tickets that are good for one year from the time you complete the assessment.

I am currently working on my doctoral dissertation research on “An exploration of the relationship between students taking online classes and their personality types” at Northern Illinois University.

You were recruited to be part of this project because you were a student who has enrolled in at least two online classes at Elgin Community College. Please take 15 - 20 minutes to participate in this brief web-based DISC personality assessment created by Inscape Publishing, Inc. Note that you will be asked for demographic information such as your gender, age, and employment status.

Please remember to sign the attached consent form and mail it back in the attached stamped envelope. Once I receive your signed consent form I will e-mail you the assessment URL link and your personalized access code to complete the assessment.

Your answers will be completely confidential. Your personalized access code will be used for tracking purposes only. At the end of the assessment you will be given the option to print and/or save your assessment results in an electronic format.

Thank you in advance for your participation in this project. If you have any questions or concerns, please contact me at (630) 660-1909 or mchahino@yahoo.com. You may also contact my dissertation chair, Dr. Lara Luetkehans at (815) 753-9339 or luetke@niu.edu

Sincerely,

Michael Chahino

Assessment Access Code E-mail to Participants

[Date]

Michael Chahino
316 Willow Lane
Geneva, IL 60134

Dear (student name)

Thank you for agreeing to participate in this study, for signing the consent form, and for your willingness to take the web-based DISC personality assessment. I am currently working on my doctoral dissertation research on “An exploration of the relationship between students taking online classes and their personality types” at Northern Illinois University.

To complete the assessment online, please go to the URL below. Enter the personalized access code provided below, and then follow the online assessment instructions.

To begin the assessment, please go to <https://www.inscape-epic.com> and supply the following personalized access code: _____

Thank you again for your participation in this project. If you have any questions or concerns, please contact me at (630) 660-1909 or mchahino@yahoo.com. You may also contact my dissertation chair, Dr. Lara Luetkehans at (815) 753-9339 or luetke@niu.edu

Sincerely,

Michael Chahino

APPENDIX D

INFORMED CONSENT FORMS

ONE-ON-ONE INTERVIEW INFORMED CONSENT FORM

ADULT (18 or older)

I agree to participate in the research project titled “An exploration of the relationship between students taking online classes and their personality types” being conducted by Michael Chahino, a graduate student at Northern Illinois University.

I understand that the intended benefits of this study include the exploration of students’ personality types using the DISC model personality assessment and to identify which personality types are most likely to succeed in an online academic institution.

I understand that if I agree to participate in this study, I will be asked to participate in a 20 to 30 minute one-on-one interview.

I am aware that my participation is voluntary and may be withdrawn at any time without penalty or prejudice, and that if I have any additional questions concerning this study, I may contact Michael Chahino at (630) 660-1909, or Dr. Lara Luetkehans at (815) 753-9339. I understand that if I wish to obtain further information regarding my rights as a research subject, I may contact the Office of Research Compliance at Northern Illinois University at (815) 753-8524.

I understand that all one-on-one interviews will initially be recorded on audiotapes. The facilitator will keep the tapes in a lock-box until they are fully transcribed. Once they have been transcribed, the tapes will be destroyed and thrown away. The transcribed one-on-one discussions will be saved on a private computer to which only the facilitator has access. Once the study has been completed, all transcriptions will be held in a lock-box along with the individual consent forms and will be destroyed after five years.

I understand that my consent to participate in this project does not constitute a waiver of any legal rights or redress I might have as a result of my participation, and I acknowledge that I have received a copy of this consent form.

Signature of Subject

Date

I agree to have the interview audio-taped

Signature of Subject

Date

INFORMED CONSENT FORM
FOR
ONLINE DISC PERSONALITY PROFILE ASSESSMENT
ADULT (18 or older)

I agree to participate in the research project titled “An exploration of the relationship between students taking online classes and their personality types” being conducted by Michael Chahino, a graduate student at Northern Illinois University.

I understand that the intended benefits of this study include the exploration of students’ personality types using the DISC model personality assessment and to identify which personality types are most likely to succeed in an online academic institution.

I understand that if I agree to participate in this study, I will be granting the researcher permission to compare my online course grades with the results of my personality assessment. I agree to complete a web-based DISC personality assessment in which I will be asked to provide demographic information such as my gender, age, and employment status.

I understand that I might be asked to participate in a follow up one-on-one interview that might take up to 30 minutes.

I am aware that my participation is voluntary and may be withdrawn at any time without penalty or prejudice, and that if I have any additional questions concerning this study, I may contact Michael Chahino at (630) 660-1909, or Dr. Lara Luetkehans at (815) 753-9339. I understand that if I wish to obtain further information regarding my rights as a research subject, I may contact the Office of Research Compliance at Northern Illinois University at (815) 753-8524.

I understand that all information gathered during this research will be kept confidential by saving them on a private computer to which only the facilitator has access. All collected data along with the individual consent forms will be held in a lock box and, once the study has been completed, will be destroyed after five years.

I understand that my consent to participate in this project does not constitute a waiver of any legal rights or redress I might have as a result of my participation, and I acknowledge that I have received a copy of this consent form.

Signature of Subject

Date

APPENDIX E

DiSC[®] INSTRUMENT: COVER PAGE



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APPENDIX F

QUALITATIVE RESEARCH QUESTIONS

Qualitative Research Questions/Interview Questions

1. What do you think about the personality type DISC assessment?
2. Describe your online courses experience here at Elgin Community College.
3. Which personality type attributes are critical for online college students to succeed in their online courses?
4. What specific skills and abilities are vital for online college students to succeed in their online courses?
5. What other factors contribute to online college students' success in their online courses?