CHAPTER 1

Teachers and students have been engaged in two-way correspondence since the beginning. Technology has been used to supplement communication in higher education since the early 1900s. Technology now includes television, radio, satellites, the Internet, email, video conferencing, and much more (Collins & Dewees, 2001). Early pioneers of technology use include the University of Wisconsin-Madison and Penn State University. In 1907 the University of Wisconsin-Madison used the radio to broadcast adult education programs across the United States (Distance Education Certificate Program, 2005; Hanna, 2000). In the early 1920s, Penn State University followed the University of Wisconsin-Madison's lead by broadcasting course lectures across the entire nation too (Hanna, 2000; Distance Education at Penn State, 2005).

These projects were deferred in the 1950s and 1960s as enrollments skyrocketed due to the G.I. Bill. College administrators spent most of their time and resources constructing facilities and hiring faculty to handle the surging student population. In the 1950s, Penn State University upgraded from radio broadcasting to the use of an on-campus interactive TV network to accommodate the drastic increase in enrollment caused by the G.I. Bill (Hanna, 2000). As time passed, the enrollment in institutions of higher education continued to grow forcing universities to establish more efficient methods of instructing more people. One solution used to accommodate the larger enrollments on campus was the extended use of technology (Carswell, Thomas, Petre, Price, & Richards, 2000; Wei & Johnes, 2005).

The role of technology in higher education has continued to grow and change during the past 100 years. The forms of technological equipment used by college professors and administrators during the past century include a wide variety of instruments and methods. The continuum of equipment includes audio, cable television, satellites, instructional television fixed

services, videotex, electronic blackboard, videocassettes, videodisc, and teleconferencing (Collins & Dewees, 2001; Smith & Stroud, 1982). Recent additions to this list include the Internet, compact discs, computers, and lasers. The addition of this equipment and the role it plays in the quality of higher education has changed the learning experiences of students (Distance Education at Penn State, 2005; Distance Education Certificate Program, 2005; Hanna, 2000). There are six major benefits of technology for institutions and students: convenience, access, individualization, participatory learning, amount of information available, and the opportunity to learn in a fun, exciting method (Carswell, et al., 2000; Collins & Dewees, 2001; Ham & Davey, 2005; Sharma & Maleyeff, 2003; Wei & Johnes, 2005).

How Technology Benefits Students

The primary benefit that students receive from the use of technology in their education is the opportunity to save time. Today's students have multiple commitments including activities, projects, and jobs. Any opportunity to save time and effort is important to them. Students are attracted to the convenience of technology use in class because technology offers the opportunity to save time and effort (Hara & Kling, 2002).

One example of technology saving time for students is the Internet. Online courses enable students to avoid driving to campus as they learn the material from home. Email allows students to contact professors from any personal computer rather than knocking on the professor's office door. The more time learners save the more time they can spend accomplishing additional tasks and learning new information (Anderson, McClard, & Larkin, 1995; Hara & Kling, 2002; Ryan, Scott, Freeman, & Patel, 2000).

The second benefit technology offers higher education institutions is the opportunity to reach out to more students. Technology allows institutions to reach populations besides those

learners who are able to attend formal classes on campus. For example, the Internet allows learners access to course information 24 hours per day, seven days per week (Hara & Kling, 2002). Offering information outside the classroom increases the diversity of the learning population, as adults, commuters, and learners from around the globe are able to access online courses offered by the institution. However, the more diverse the learning population becomes the more diverse learning opportunities the university should provide (Niemi & Gooler, 1987).

The third benefit technology offers to students is the opportunity to customize the learning experience to suit their own needs (Larson & Strehle, 2001). People have different needs, values, circumstances, backgrounds, preferences, plans, rates of development, and learning styles. The use of technology provides numerous options and opportunities to access information. The existence of many different options allows the learner to explore and select the learning environment they prefer (Gooler, 1987; Niemi & Gooler, 1987; Pyle, 1984). This period of exploration is essential to development because the learners can test different environments and discover for themselves which learning method supports their needs best. In addition, the asynchronous nature of recent applications in higher education technology (e.g., online courses, self-taught classes, online video lectures) allows learners to access learning modalities at different times, different places, and at a pace convenient to them (Hara & Kling, 2002). Technology allows higher education institutions to become more flexible with the way they offer education (The Carnegie Commission on Higher Education, 1974). The ability for higher education to offer individualized learning environments will be essential to its development and overall success as the population of learners continues to diversify (Niemi & Gooler, 1987).

The opportunity for individualized, self-directed learning is another benefit provided to students by technology. The goal of self-directed learning is to shift learners away from dependence on formal, structured approaches for learning to situations where students can assume responsibility for their own learning (Niemi & Gooler, 1987). Active participation in one's education stimulates mental development and learning faster than passively absorbing information via lectures (Knapper, 1980). The interactive opportunities supported by technology, particularly by online classes and simulations, stimulate mental activity and support the theory that practice makes perfect. The use of technology in higher education is causing a shift in teaching style towards interactive education and away from traditional lectures (Ryan, Scott, Freeman, & Patel, 2000).

The fifth benefit of using technology in higher education is the ability to provide learners access to a larger amount of information quickly. Learners use technology to obtain a much larger amount and variety of information than is typically available in a classroom (Gooler, 1987). Universities are in the midst of the digital revolution as libraries and research information are becoming available online in a digital format. Students can use technology to obtain library information without visiting campus (Lewis, Massey, & Smith, 2001). Forty years ago, the only sources of information available to students were the materials provided by the professor's lecture, written materials distributed in the form of textbooks, and libraries. Today, students still have lecture material, textbooks, and libraries, but they can also obtain information from other sources including corporations, self-conducted investigations, and research being conducted at other institutions. The wealth of information available to students is far greater than ever before. This increase in available information is one benefit today's students have that students in the past did not (Lewis, Massey, & Smith, 2001).

The final benefit that students have due to the use of technology in higher education is the opportunity to learn through fun, exciting methods. These new opportunities motivate the students to learn information more quickly and efficiently since the medium being used to teach is no longer the typical lecture. Students who use computers, slides, the Internet, close circuit television, and other forms of technology learn more through the practical experiences and opportunity to interact with the technology. The new technology enhances the typical lecture and helps to maintain students' attention (Gooler, 1987; Ryan, Scott, Freeman, & Patel, 2000).

Uses of Technology in Higher Education

Technology can be used in most aspects of higher education including research techniques, administrative methods, libraries, and the instructional process (The Carnegie Commission on Higher Education, 1974). Researchers use technology to retrieve previous studies, to conduct experiments, to store data, to examine data, and to analyze test results. Administration has been improved by technology through the use of databases and email correspondence. Library staff members also use technology for database purposes and improved searching capability for patrons. Professors use technology to enhance the lecture experience, assign creative assignments to students, and present demonstrations in class that once seemed impossible. The entire higher education community is taking advantage of the opportunities that the different types of technology offer (Hara & Kling, 2002; Knapper, 1980; Larson & Strehle, 2001; Lewis, Massey, & Smith, 2001; Niemi & Gooler, 1987; Pyle, 1984; The Carnegie Commission on Higher Education, 1974). This study will examine one higher education use of technology in particular: academic advising.

Academic advising is important to the academic success of students. Providing students with advice, support, and information focused on classes, curriculum, selecting majors, and other

academic topics strengthens students' quality of experience and raises their grade point averages (Crookston, 1972; Gordon, 1994; Pardee, 1994). In the past, this type of advice was provided through documents, manuals, telephone conversations with advisors, and face-to-face appointments with advisors (Ryan, Scott, Freeman, & Patel, 2000).

Existing research on academic advising examines the type of information provided to students and how satisfied students are with the information they are receiving through academic advising. The research focuses on the person-to-person interactions and the conversations that take place between a student and advisor (Alexitch, 1997; Andreas, 1983; Chando, 1997; Crockett & Crawford, 1989; Crookston, 1972; Gordon, 1994; Hybertson, Hulme, Smith, & Holton, 1992; Pardee, 1994). This study takes these findings into consideration. The results of previous research are discussed throughout the review of the literature in Chapter Two. However, very little research has examined the relationship between students and the online academic advising that many institutions provide today.

A current use of technology in higher education is to support academic advising for students. The popularity of the Internet on college campuses and students' desire for academic guidance has led to the capability of providing academic assistance and advice on the Internet. The three most significant methods for providing academic advising online include web pages, instant messaging, and email correspondence (Ham & Davey, 2005; Jackson, Ervin, Gardner, & Schmitt., 2001; Kirkwood & Price, 2005; Malaney, 2004; Morahan-Martin & Schumacher, 2000; Tenorio, 2003). This study will expand the existing knowledge on the relationship between students and their online academic advising experiences. The study seeks to examine the type of information students receive via online academic advising and how satisfied those students are with the information.

In summary, technology has been a major influence on higher education since 1900. Originally, technology was used as a novel approach to present information differently. During the mid-20th century, the increase of the student population courtesy of the G.I. Bill forced technology use to become a necessity as opposed to a luxury. The use of technology allowed more people to be educated quicker than ever before (Distance Education at Penn State, 2005; Distance Education Certificate Program, 2005; Hanna, 2000).

The forms of technology have changed from the introduction of the television to the debut of the DVD recorder (Distance Education at Penn State, 2005; Distance Education Certificate Program, 2005; Hanna, 2000; Smith & Stroud, 1982). Higher education continues to improve as the amount of technology on campus grows (Hara & Kling, 2002; Knapper, 1980; Larson & Strehle, 2001; Lewis, Massey, & Smith, 2001; Niemi & Gooler, 1987; Pyle, 1984; The Carnegie Commission on Higher Education, 1974). The current generation of students expects higher education to make use of technology to improve the educational experience and make higher education more efficient. Technology has begun to influence many student and academic services including academic advising.

In the past, academic advising was done face-to-face. Students visited their advisor and received advice or information regarding many topics including class schedules, professors, graduation, and more. However, as the student population increased the ratio between advisors and students quickly decreased. Recently, universities have begun to use the Internet to improve the efficiency and accessibility of academic advising for students. College administrators have begun to design information technology to support academic advising online. Students can use online advising for numerous purposes. Unfortunately, existing research has yet to examine the type of information that students obtain when receiving academic advising online. This study

hopes to provide some insight into why students use the Internet for academic advice and whether or not they are satisfied with their experiences.

Purpose of the Study

The purpose of this study was to examine the type of advising conducted (prescriptive v. developmental), the type of information sought, and the level of participant satisfaction experienced through online academic advising. For purposes of this study, online academic advice was defined as advice or information provided by an academic department obtained via the Internet to improve the student's academic experience. The three types of online academic advice considered for this study included (a) email correspondence with an academic advisor, (b) instant messaging or chat based conversation between a participant and an academic advisor, and (c) obtaining academic information from a department supported web page.

The population for this study consisted of 25,000 traditional-aged undergraduate students at a large, mid-Atlantic research university. All of the participants were enrolled full time. The sample included resident and commuter students. Resident students were those students who lived in university provided housing on campus. Commuter students were those students who did not live on campus and therefore commuted to campus frequently. A convenience sample was selected though efforts were made to include equal representation among participants by sex, race, class standing, and academic college.

Data was collected by administering a version of Winston and Sandor's (1984) Academic Advising Inventory (AAI) modified specifically for this study. The AAI was divided into four sections or scales: Developmental-Prescriptive Advising (DPA), Advisor-Advisee Activity, Satisfaction with Advising, and Demographics. Each section of the instrument measured a different construct.

The first section of the Academic Advising Inventory measured the Developmental-Prescriptive Advising scale. The DPA scale focused on the type of advising being received by the participant. The AAI measured two types of academic advising, prescriptive advising and developmental advising. The section contained 13 items. Each item contained two phrases and required a forced choice by the participant. The participant was asked to read each phrase. Participants were asked to select one statement from each pair of phrases and rate how true they feel that phrase was on a 4-point Likert scale ranging from 'slightly true' to 'very true.'

The second section in the Academic Advising Inventory measured the Advisor-Advisee Activity scales. The Advisor-Advisee Activity scales focused on the types of activities that take place in an advisor-advisee relationship. Part II of the instrument contained 28 items. Each item listed one activity. Participants were asked to select how often they had been involved in each activity with their online academic advising experience during the academic year. The six response options ranged from 'None' to '5 or more times.'

The third section in the Academic Advising Inventory measured the participant's satisfaction with the online academic advising experience. Part III of the instrument contained five items. Each item was a statement referring to one's satisfaction with various aspects of advising. Participants were asked to read each item and to select how much they agreed with that phrase based on four response options: (a) strongly disagree, (b) disagree, (c) agree, and (d) strongly agree.

The final section of the Academic Advising Inventory recorded the participant's demographic information. Part IV of the AAI contained nine items. The demographic information that was collected for the this study included gender, cultural/racial background, age, academic class standing, academic college, type of residence (resident or commuter), type of

online advising experienced, time spent during an online academic advising opportunity, and number of online academic advising sessions participated in over a 6-month period of time. For purposes of this study, type of residence was defined as whether the participant lived on campus or not on campus.

Research Questions

Specifically, this study was designed to address the following questions:

1. What type of advising, prescriptive or developmental, do undergraduate students receive when seeking online academic advising?

2. What type of information do undergraduate students seek from online academic advising?

3. How satisfied are undergraduate students with their online academic advising experience?

4. How does the type of advising obtained via online academic advising vary by gender?

5. How does the type of advising obtained via online academic advising vary by type of residence (resident or commuter)?

6. How does the type of advising obtained via online academic advising vary by race?

7. How does the type of advising obtained via online academic advising vary by academic college?

8. How does the type of information obtained via online academic advising vary by gender?

9. How does the type of information obtained via online academic advising vary by type of residence?

10. How does the type of information obtained via online academic advising vary by race?

11. How does the type of information obtained via online academic advising vary by academic college?

12. How does satisfaction with online academic advising vary by gender?

13. How does satisfaction with online academic advising vary by type of residence?

14. How does satisfaction with online academic advising vary by race?

15. How does satisfaction with online academic advising vary by academic college?

Significance of the Study

This study was significant in terms of future practice, research, and policy. In terms of practice, the results were significant for several campus constituencies. One group that might benefit from the results includes faculty responsible for providing academic advising. The results provided advisors with data about the types of information sought by students and how satisfied students are with the online academic advising process. Faculty advisors might use the results to examine their current online academic advising procedures and to evaluate their success.

Students who use the Internet to obtain academic advice might benefit from the results of this study. The results provided students with data about the types of information that are most often sought. Students might use these results to improve the efficiency of their online academic advising experiences.

A third group that may benefit from the results of this study are academic department staff members. The results described the type of information students seek when searching for online academic advice and how satisfied they are with the online academic advising experience.

Academic department staff might use these results to improve the online academic environment for the students.

Finally, the Council for the Advancement of Standards for Student Services/Development Programs (CAS) might benefit from the results of this study. The findings provided the type of information students seek when obtaining online academic advice. CAS might use this information to establish standards of practice for the online academic advising environment.

This study also had significance for future research. For example, this study explored the type of information traditional aged undergraduate students seek via online academic advice. Future studies might examine the procedures used to transmit that information to students (e.g., instant messaging, email correspondence, web pages) and whether there is a difference in the type of information obtained based on the online method being used. Such a study would expand on what is known about the effectiveness of online advising.

This study examined the type of information sought by students using academic advising. Future research might be conducted on how often students seek online academic advice and whether or not satisfaction with online advice is related to the frequency of the use of such services. Such a study would expand on what is known about factors that influence satisfaction with online advising.

This study also examined the type of information undergraduates sought during online academic advising and how satisfied undergraduate students were with online academic advising. A future study might examine the type of information sought by graduate students and how satisfied graduate students are with current online academic advising capabilities. Such a study would expand the information available about online advising for students in general.

Finally, the study was significant in terms of future policy. To date, academic advising has focused on person-to-person interactions and individual needs (Fielstein, 1989; Pardee, 1994). The present study offered insight into those needs and how those needs could be satisfied using an effective online academic advising procedure. Data might be used to assess policies related to online advising procedures.

The results of this study might also impact future policy on departmental online academic advising. This study examined the type of information sought and how satisfied students were with using online academic advising. Data might be used to evaluate the advising policies within an academic department.

This study might also impact the future policies of university technology departments. This study examined the type of information students obtained via online academic advising. Data might be used assess policies within the university technology department concerning the types of information made available to students online.

Delimitations of the Study

As with all research, the current study had some initial delimitations. The first deals with the instrumentation. All the participants in this study were asked to complete a questionnaire. It is possible that participants may have interpreted items on the instrument differently. If so, this might have influenced the results.

A second delimitation also related to the instrument. The responses to the instrument were self reported and participants may not have been candid when responding to items. This may have influenced the results of the study.

A final delimitation was related to the sample. The sample in this study was selected with the intentions of obtaining a fair representation of participants by race, sex, class standing,

type of residence, and academic college at the institution studied. The use of purposeful sampling limited the participants involved. This may have influenced the results.

Despite these delimitations, this was a worthwhile study. It examined the type of academic advising administered online, the type of information sought by students who use online academic advising, and it examined the levels of satisfaction exemplified by students seeking academic advice online. The results of the study contributed to future practice, research, and policy.

Organization of the Study

This study is organized in five chapters. Chapter One examined the background, purpose, and significance of the study. The second chapter will review the literature relevant to the study. In Chapter Three, I will review the methods for selecting the sample and gathering data for the study. Chapter Four will present the results of the study. Finally, the concluding chapter will discuss the results of the study and their implications for future practice, research, and policy.

CHAPTER 2

REVIEW OF THE LITERATURE

The purpose of this study was to examine the type of advising provided by online academic advising, the type of information sought by undergraduate students seeking online academic advice, and the levels of satisfaction undergraduates express after receiving online academic advising. To initially examine the literature relevant to this study, I explored the literature on two topics: academic advising and student use of the Internet at higher education institutions. Each included groups of studies relevant to this study.

Four groups of studies emerged while exploring the literature on academic advising: (a) studies on styles of academic advising, (b) studies on academic advising and gender, (c) studies on academic advising and type of residence, and (d) studies on academic advising and race. Research has been conducted examining the academic advising within a particular college but at the time this study was conducted, no research comparing the academic advising between academic colleges existed. However, some research has been conducted studying academic advising for undecided students.   Each group of studies is discussed in detail in the first section of this literature review.

To fully explore the online academic advising process I also considered the literature on Internet use in higher education institutions. The second section of the literature review focuses on how college students currently make use of the Internet. The studies are categorized into three groups: (a) studies on Internet use by gender, (b) studies on Internet use by type of residence, and (c) studies on Internet use by race.   At the time of this study, no research existed examining student Internet use and academic colleges. This literature review is organized around these two major categories and their respective subtopics.

Research on Academic Advising

To examine the type of advising provided by online academic advising, the type of information sought by undergraduate students seeking online academic advice, and the levels of satisfaction undergraduates exhibit after receiving online academic advising, I examined research on academic advising, particularly styles of advising and the observed differences in academic advising by gender, type of residence, and race.

Styles of Academic Advising

The literature on academic advising makes note of two major styles of advising: developmental advising and prescriptive advising. Each style is different and the most effective style depends on the learning needs and maturity levels of the person being advised (Crockett & Crawford, 1989).

Developmental advising is an advising approach that can be defined as:

A systematic process based on a close student-advisor relationship intended to aid students in achieving educational, career, and personal goals through the use of the full range of institutional and community resources. It both stimulates and supports students in their quest for an enriched quality of life (Ender, Winston, & Miller, 1984, p. 19).

Developmental advising is heavily driven by the goals and work ethic of the student. The advisor supports the student by providing challenges and options. Students adapt and grow by exploring those options on their own. The advising is done through the presentation of opportunities and student exploration of those opportunities instead of providing students with answers. The advisor acts as a facilitator encouraging independence and problem-solving skills in the student (Chando, 1997). Some negative outcomes of developmental advising are: (a) takes

more time than prescriptive advising, (b) large amount of cases, (c) requires advisor training, (d) lack of consistency, (e) autonomous advising units, (f) lack of training and working with a diverse student body, and (g) lack of effective evaluation strategies (Gordon, 1994).

A prescriptive advising style is a style of advising where the advisor spends less time asking questions and more time giving answers or "prescribing" treatments. The students assume little responsibility for making the decisions (Crookston, 1972). The situations most often resolved through prescriptive advising are: (a) clarifying graduation requirements, (b) discussing course selection, (c) organizing a course of study, (d) discussing educational goals, (e) exploring career possibilities, and (f) explaining registration (Fielstein, 1989). Many students are accustomed to receiving this style of academic advising because they have not been exposed to anything else (Pardee, 1994).

Both developmental and prescriptive advising have been proven to be successful styles of advising (Crookston, 1997; Gordon, 1994; Pardee, 1994). The most effective style is really based on the needs and background of the student involved.

Differences in Academic Advising by Gender

There are many influences on college students that affect their needs or preferences for academic advising. One of those influences is the gender of the student. Students' gender may have an influence on which style of advising is most effective for them, the type of information sought via academic advising, or their overall satisfaction with the academic advising experience (Alexitch, 1997, 2002; Frost, 1991). The gender of a student can powerfully influence the advising experiences of the students.

Female students prefer a greater level of developmental advising than male students (Crockett & Crawford, 1989). The advising is done through the presentation of opportunities

and student exploration instead of presenting the students with answers. Females prefer to have discussions and to seek information on the opportunities available to them. Ultimately, female students prefer more discussion of academic and career related issues that provide chances for self-exploration than do male students.

Female students also prefer a higher frequency of advising activities than male students (Alexitch, 1997). Male students seek less interaction because they are often less interested in their academic advising opportunities than female students. Female students enjoy interactions with faculty members and other academic advising chances because they prefer to be more involved in the advising experience than male students. This interest in involvement is often called help seeking attitude.

The help seeking attitude of women varies from the help seeking attitude of men (Alexitch, 2002). Women prefer to contact and to initiate conversations with professors to discuss their academic situation, goals, and opportunities. Men prefer more passive approaches to gaining academic information including fewer conversations, less confiding in peers, and an overall lack of desire to self explore into their academic career. The contrast in behavior can influence the preferred style of academic advising based on the gender of the student.

Differences in Academic Advising by Type of Residence

Students enrolled in an institution are either residents or commuters. Resident students live on the university campus or in university owned housing. A commuter student is defined as any student attending college who does not live in university owned housing (Jacoby, 1989). Commuter students are generally the largest student body on any campus and make up 86% of today's college students (Horn & Berktold, 1998). Commuters have unique needs and spend

their time trying to obtain an education while balancing several other time commitments that take priority over the education.

Major themes observed in the literature about commuter students are the demands, the factors, and the personal needs generated by the commuter student lifestyle. The responsibilities that many of these students experience away from college create personal and environmental factors that influence how they think, feel, and act on a daily basis. These factors should be taken into consideration when deciding on an academic advising style with a student who commutes.

The demands placed on the time of a commuter student include education, employment, finances, and family (Wolfe, 1993). Many commuter students work full time to afford college. This divided lifestyle leads to varying levels of development (Andreas, 1983). Students may be very well developed emotionally and intellectually, but are not well developed socially because they do not have time to form the interpersonal relationships necessary to spark social development. The classroom does not allow enough socializing with peers unless the instructor purposefully designs activities with the intention of increasing peer-to-peer interactions.

Some research shares details about the types of needs a commuter student may have when compared to other college students. These needs include physical, emotional, spiritual, occupational, social, and intellectual needs. Physical needs include exercise, sleep, safety, and other physical demands required by a student to be healthy. Commuter students often have more time commitments to balance when scheduling their time. Resident students are often supplied with gyms, dining halls, and the ability to walk to class. Commuter students do not have these accommodations at their disposal. The need to maintain a healthy lifestyle may therefore be more difficult for a student who does not live in university owned housing.

Emotional needs include feelings about self, others, and particular situations. Resident students have many sources of support including on campus counseling centers and resident advisors. Commuter students live a more individualistic lifestyle. The influences on a commuter student, in addition to classes, may include a family, job, bills, and other time consuming activities. The students living off campus lack the convenient sources of support provided on campus for resident students.

Spiritual needs include the pursuit of meaning through philosophy and/or religious manners. Generally, students who live in university owned housing must share small spaces with roommates. Living in close quarters with students of different backgrounds, view, and spiritualities can lead to many educational or even confrontational situations. Career goals and a student's plan of study are both considered occupational needs. Students who live off campus are often already working and trying to establish themselves in the workforce. Many residential students still focus most of their time on academics and only seek job opportunities through internships and co-op scenarios. Social needs include friends, marriage, and relationships.

Finally, intellectual needs including the ability to understand, analyze, write, and read. Most resident students can be classified as underclassmen. These students are still learning the necessary skills to read, write, and analyze appropriately. Many commuter students are older, upper class students who have some experience with research. Commuter students are trying to meet the needs of their future employers as they fine-tune their reading, writing, and analytical skills. Regardless, an institution must keep two different factors in mind when hoping to accommodate the needs of commuter students; (a) personal factors and (b) environmental factors (Hybertson, Hulme, Smith, & Holton, 1992).

Personal factors and environmental factors are major influences on the needs of commuter students. Personal factors deal with the student on an individual basis. Environmental factors deal with the student and those events or people in his or her life that influence the way the student thinks, acts, and feels. Traditional college students are typically influenced by personal factors. Non-traditional commuter students are more often influenced by environmental factors. In a study conducted in 1992 by Hybertson, Hulme, Smith, and Holton the most frequent personal factors for commuter students included:

1. Balancing one's needs with the needs of others,

2. Managing all the responsibilities asked of him,

3. Maintaining control over one's life,

4. Lack of sleep,

5. Communicating one's problems, and

6. Eating healthy (Hybertson, et al, 1992, p. 53).

The last three items in the list were not mentioned as often as those at the top of the list but they do provide a basic illustration of the types of personal factors influencing the lives of commuter students. On the other hand, the same study was conducted on nontraditional commuter students. The environmental factors mentioned frequently by those students included:

1. Being overwhelmed by all of one's responsibilities,

2. Having a family support system at home,

3. Having a support system of friends,

4. Dealing with the loss of a relationship through death, divorce, or other forms of loss, and

5. The lack of a strong support system (Hybertson, et al, 1992, p. 54).

Personal factors influence the behavior of commuter students more frequently than environmental factors. Most of the literature that discusses institutional support and solutions for commuter students takes these factors into consideration.

Differences in Academic Advising by Race

The majority of African American students in the United States attend predominantly white institutions (National Center for Education Statistics, 1998). Academic advising has been proven to improve grades and retention rates among undergraduate African American students in higher education (Giles-Gee, 1989; Young and Rogers, 1991). Existing research focuses on the topics discussed by minority students with academic advisors and the effects academic advising has on the higher education experiences of those students.

A study conducted at Towson State University in 1998 spent two years meeting with two cohorts of African American freshmen to determine patterns, needs, and trends in their academic sessions. The advisors met with the students every two weeks and kept records of their discussions. Students were asked to complete a survey after each semester. Findings from this study indicated that the topics discussed included registration for classes, selection of a major, employment, finances, and enrollment. An interesting finding discovered that some social issues were not talked about because students were reluctant to bring those issues up in conversation with their advisors. The study determined that this reluctance might have been related to the fact that a majority of the advisors were white faculty members or administrators (Giles-Gee & Kerns, 1998).

A study conducted three years ago in the College of Engineering at the same institution as the present study discovered that African American students felt academic advising was more important to them than White students did. If a minority student is transitioning from a very

diverse school to a predominantly white institution then special anxieties may arise (Burrell & Trombley, 1983; June, Curry, and Gear, 1990; Littleton, 2001; Mau and Fernandes, 2001; Nettles, 1988; Schweitzer, Griffin, Ancis, and Thomas, 1999). A demonstrated sensitivity for adjustment when advising African American students enables the institution to respond to students' needs and concerns before they materialize into significant academic or social problems (Burrell & Trombley; 1983; Herndon, 2001; Littleton, 2001; Moore, 2001; Schweitzer et al., 1999). These are all topics and concerns that should be taken into consideration when implementing online academic advising at any institution. It is important to recognize the needs of minority students as they adjust to college and to make an effort to support those needs through online academic advising if possible.

Academic Advising for Undecided Students

Students who enroll in college are developing and maturing adults. As they gain psychosocial and cognitive skills, the experiences and opportunities that are presented to them must take on a very specific sequence, timing, and content in order to be most effective. This is particularly true for undecided students. Undecided students are those students who have yet to choose a career or academic path (Gordon, 1984). Research has shown that a developmental approach to advising is particularly helpful for undecided students. Undecided students are seen as students continually participating in a series of developmental tasks that allow them to adapt and change within a diverse world of opportunities until they feel comfortable and aware enough to take responsibility for their decisions (Gordon, 1981). Developmental advising recognizes the different needs and rate of growth unique to each student.

Since individual students develop at their own pace, undecided students cannot be grouped together as a whole. Previous research has attempted to extrapolate findings from

smaller samples but have not been successful in establishing trends that can be applied to all undecided students. Therefore, the services and opportunities offered to undecided students must be customizable to their needs and not institutional protocol or requirements implemented on all students (Gordon, 1984). The developmental theories of Chickering (1969) and Perry (1970) provide important constructs that should be taken into consideration when designing academic advising opportunities for any student, particularly those that are undecided.

Many students are not prepared to make life decisions at the age of 18. Chickering (1969) discovered that students are more focused on developing physical and social competencies, establishing interpersonal relationships, and finding emotional independence at eighteen years of age. Perry's (1970) research includes findings on the dualistic nature of students. Students are unable to view multiple perspectives as they make decisions. Their dualistic nature and perspective only allows them to see a limited number of options. It is because of these discoveries that a developmental style of advising is critical for all students. Providing the resources and customizing the experience to the student's needs allow for the student to build responsibility, awareness, and competence as they grow and make decisions for themselves. The environment must be one of both challenge and support (Knefelkamp, Widick, and Parker, 1978; Perry, 1970).

Research on Student Internet Use in Higher Education

People have been communicating by email through intra-connected local networks since the 1970s (Malaney, 2004). One decade later, in 1988, specific university courses began requiring that any student registered in the class make their own accommodations for gaining access to a computer for course purposes (Kirkwood & Price, 1995). Then, in 1989, the World Wide Web was introduced to the general population of computer users around the world

(Malaney, 2004). During the 1990s, students attending universities became the first members of society to gain regular access to the Internet, the World Wide Web, and the new opportunities it offered including America Online's Instant Messenger and the free Mosaic browser known as Netscape (Jones, 2002; Malaney, 2004). Today's students use the Internet more frequently than ever before. The percentage of institutions requiring students to have access to a computer has increased from 37% in 1988 to 89% in 2002 (Ham & Davey, 2005). Students view the Internet as a functional tool capable of supporting many of their daily needs. The students attending colleges have a real difficulty remembering the days before the Internet existed because when the Internet was created the students were one year old (Jones, 2002).

College students use the Internet more often than any other population. Ninety-eight percent of college students own a computer and 90% of those students access the Internet at least once per day (Jones, 2002; Malaney, 2004; Morahan-Martin & Schumacher, 2000). This continuous and constant use of the Internet is becoming more encouraged in the university setting as more and more courses and services require student access and use of the Internet on their respective campuses. The use of the Internet has become a nearly ubiquitous portion of the college student's daily routine. Students use the Internet for three main purposes: (a) academic, (b) recreation, and (c) social (Jackson, Ervin, Gardner, & Schmitt, 2001; Jones, 2002; Malaney, 2004; Morahan-Martin & Schumacher, 2000). The three major functions provided by the Internet for supporting these purposes are surfing the web, email, and instant messaging or online chat (Ham & Davey, 2005; Jackson, et al., 2001; Kirkwood & Price, 2005; Malaney, 2004; Morahan-Martin & Schumacher, 2000; Tenorio, 2003).

College students use the Internet to support their studies and coursework (Wei & Johnes, 2005). Research has shown that students admittedly use the Internet as their primary source for

researching topics and finding information to support their academic interests (Brett & Nagra, 2005; Kirkwood & Price 2005). Students email faculty members and teaching assistants to ask for help with assignments, extensions on major projects, and updates on their grades (Tenorio, 2003). The Internet is also used to review course materials and communicate with peers from class. Students use the Internet to conduct research and complete homework assignments (Sax, Ceja, & Teranishi, 2001). Even though using the Internet to support their courses is not the primary reason students use the Internet, it is still a purpose that absorbs a considerable amount of time on the World Wide Web (Malaney, 2004).

The second purpose why students use the Internet is for recreation. Students enjoy spending time on the Internet surfing the World Wide Web for games, seeking out new information, and downloading new music and software for their entertainment. Seventy-eight percent of students report getting online just for fun (Jones, 2002). The Internet is so large that many students will explore the web for hours with no real purpose beyond relaxing and removing themselves from the pressures of class. Student use of the Internet for recreation challenges their time management ability, self-directive behaviors, self-confidence, and self-discipline as the students learn to manage both their recreational and academic lifestyles without parental guidance (Ham & Davey, 2005).

Finally, the primary reason that students use the Internet is to socialize. Email is the most popular form of Internet use among college students (Jackson, et al., 2001). Two thirds of college students maintain at least two email addresses (Jones, 2002). The students use the Internet to communicate with friends, family, and faculty. Communication occurs via email, instant messaging, and online chat-based technologies such as discussion boards and forums (Malaney, 2004).

These three purposes provide the foundation for college student Internet use in today's population. These students have been working with computers and the Internet since the age of five. By the end of 2005, some authors predicted that nearly 16.3 millions students will have access to the Internet (Malaney, 2004). The process of developing a firm sense of identity and developing meaningful relationships, in combination with easy access to the Internet and the expectation to use the Internet for information seeking, lead students to use the Internet frequently (Malaney, 2004). However, the fact that a majority of students use the Internet does not mean that all students use the Internet the same way. Researchers should also take into account the characteristics of each individual learner when evaluating why a student uses the Internet. The gender, residence type, and race of each student may weigh heavily on the experience the student has when they use the Internet.

Differences in Student Internet Use by Gender

Research shows that the use of the Internet varies based on the gender of the student. The reasons that students log on differ based on whether the student is male or female (Malaney, 2004; Jackson, et al., 2001). These differences are based on the needs and natural help seeking behaviors of the students.

Female students have a tendency to be more successful and more persistent when they are comfortable with their environment. Most female students are not comfortable working with new technology. Reports show that female students experience more computer anxiety, less computer self-efficacy, and less favorable attitudes towards computers overall than male students (Jackson, et al., 2001). These feelings can all be related to the fact that female students frequently experience less access to computers than male students as they grow up (Carswell, Thomas, Petre, Price, & Richards, 2000). Males tend to be more excited and interested in

computer technology at a younger age. Also, female students tend to seek help more often than men (Morahan-Martin & Schumacher, 2000). Therefore, female students end up wanting to seek help but avoiding the use of new technology to do so.

Female students who do choose to use the Internet frequently use it for interpersonal purposes such as email. Female students spend more time emailing peers, family, and faculty than male students (Jackson, et al., 2001). This supports the tendency for females to be more interpersonal than males. The second reason female students use the Internet is to complete coursework or to do research for upcoming class projects (Malaney, 2004).

Men are more information and task oriented than females (Jackson, et al., 2001). Male students tend to be more technologically sophisticated and more comfortable with real-time interactive activities such as online games and chatting. Reports and studies show that men feel more comfortable and competent online than female students (Morahan-Martin & Schumacher, 2000). They prefer multiple choice, prescriptive sources of information on the Internet (Wei & Johnes, 2005). Male college students are the heaviest users of the Internet. They spend most of their time surfing the web, chatting with friends on instant messenger, and playing games on the Internet. Men spend less time using email than females (Jackson, et al., 2001; Malaney, 2004; Morahan-Martin & Schumacher, 2000). These differences support the research illustrating that all students use the Internet an equal amount of time. However, the tasks they accomplish while spending time online vary based on the gender of the student.

However, the research does show some similarities between the Internet use of male and female students. First, all students spend an equal amount of time shopping online regardless of their gender. Second, male and female students express an equal amount of trust in the privacy and protection they experience while using the Internet and surfing the World Wide Web

(Jackson, et al., 2001; Malaney, 2004). Another characteristic that may influence a student's Internet use is the location of the student.

Differences in Student Internet Use by Type of Residence

As higher education institutions continue to enroll more students from different locations the number of distance learners and off campus students continues to increase. The goal when working with off campus learners is to provide an experience as similar as possible to that of the traditional classroom experience (Imel, 1998). Off campus learners develop an autonomy unlike that of students who live on campus (Tenorio, 2003). The students living off campus appreciate the flexibility and convenience created by the Internet. Off campus students experience less contact with faculty so they become accustomed to using the discussion board spaces and websites to gather information for coursework (Wei & Johnes, 2005). The use of the Internet overcomes barriers created by distance and allows off campus students to focus on being better time managers (Imel, 1998). This focus on time management and independence instills flexibility in off campus students who use the Internet. The off campus students view the face-to-face contact with peers as a social experience more so than students who live on campus and attend the same classes. The interaction with other people is something the independent off campus student craves (Wei & Johnes, 2005). Those students who live off campus, while supporting a family and a job, truly appreciate the flexibility and convenience offered by the Internet (Kirkwood & Price, 2005). These experiences of autonomy, flexibility, and social perspective on the face-to-face communication are not the same Internet uses and perspectives experienced by on-campus students. The experiences of on-campus students were discussed heavily in the previous section illustrating the differences in student Internet use by gender.

Differences in Student Internet Use by Type of Race

The current research on student Internet use and race shows that students of different races actually use the Internet for similar purposes. However, the major differences involve the level of technology preparedness and the lack of access that minority students experience compared to other students. Students from lower income and minority backgrounds continue to be less likely than other students to have been exposed to the Internet prior to college (Sax, Ceja, & Teranishi, 2001). The lowest levels of computer ownership and access exist in the African-American and Hispanic communities. These low levels and minimal experiences have influence on the type of Internet use and experiences students from low income or minority backgrounds may experience. These students use the Internet for less and therefore appreciate the value of traditional face-to-face experiences more. The amount of time spent on the Internet is not as high as the amount of time spent by students of other races. The purposes of computer use are similar, however, the appreciation for and the amount of time spent using a computer is much less due to the lack of computer access and ownership prior to the student's enrollment in college.

Conclusion

In conclusion, there is a wealth of research on the types of advising students seek and the differences in the advice they seek by gender, type of residence, race, and academic college (Alexitch, 1997; Andreas, 1983; Chando, 1997; Crockett & Crawford, 1989; Crookston, 1972; Gordon, 1981, 1984, 1994; Hybertson, Hulme, Smith, & Holton, 1992; Knefelkamp, Widick, and Parker, 1978; Pardee, 1994). There is also literature on the levels of student satisfaction with advising and how those levels of satisfaction vary by gender, type of residence and race (Alexitch, 1997, 2002; Frost, 1991; Giles-Gee, 1989; Young and Rogers, 1991).

Another body of research has uncovered the many student uses of the Internet on campuses across the country. These studies have examined the uses of technology by students and the differences in those uses by gender, by type of residence, and by race (Brett & Nagra, 2005; Carswell, Thomas, Petre, Price, & Richards, 2000; Ham & Davey, 2005; Imel, 1998; Jackson, et al., 2001; Jones, 2002; Kirkwood & Price, 1995; Malaney, 2004; Morahan-Martin & Schumacher, 2000; Sax, Ceja, & Teranishi, 2001; Tenorio, 2003; Wei & Johnes, 2005).

Nonetheless, it would seem that research on the intersection between academic advising and the use of the Internet is limited. This study addresses the gap currently existing between academic advising and student Internet use in higher education. This study added new information to the literature about online academic advising, particularly the type of information students sought online, the style of advising they received, and how satisfied they were after their online academic advising session. This study also examined the differences in those topics by gender, by type of residence, by race, and by academic college.

CHAPTER 3

METHODS

The purpose of this study was to examine online academic advising. Specifically, I examined the type of advising (prescriptive or developmental) received by students seeking academic advising online, the type of information online academic advising users sought, and how satisfied those users were with the advice obtained. For purposes of this study, online academic advice was defined as advice or information provided by an academic department through an Internet website, correspondence by email, or correspondence using an instant messaging or chat supporting software.

Because there is little known about online academic advising, I used an existing instrument designed to measure the same characteristics for traditional academic advising. Winston and Sandor's (1984) Academic Advising Inventory provided quantifiable data that could be analyzed and processed through statistical tests to answer the following research questions:

1. What type of advising, prescriptive or developmental, do undergraduate students receive when seeking online academic advising?

2. What type of information do undergraduate students seek from online academic advising?

3. How satisfied are undergraduate students with their online academic advising experience?

4. How does the type of advising obtained via online academic advising vary by gender?

5. How does the type of advising obtained via online academic advising vary by type of residence (resident or commuter)?

6. How does the type of advising obtained via online academic advising vary by race?

7. How does the type of advising obtained via online academic advising vary by academic college?

8. How does the type of information obtained via online academic advising vary by gender?

9. How does the type of information obtained via online academic advising vary by type of residence?

10. How does the type of information obtained via online academic advising vary by race?

11. How does the type of information obtained via online academic advising vary by academic college?

12. How does satisfaction with online academic advising vary by gender?

13. How does satisfaction with online academic advising vary by type of residence?

14. How does satisfaction with online academic advising vary by race?

15. How does satisfaction with online academic advising vary by academic college?

This chapter begins with a discussion of how I selected my sample for this study. The chapter then provides a detailed description of the instrumentation followed by a discussion of the instrument's reliability and validity. Finally, this chapter describes the data analysis approach taken to obtain the implications illustrated by this study.

<center>Sample Selection</center>

The population for this study consisted of undergraduate students at the study institution who actively received online academic advice during a specific time period. There were three criteria for being a participant in this study. First, the participant must have actively received online academic advice between September 1, 2005 and December 15, 2005. Participants may

have received online academic advice using three possible techniques. Participants may have received academic advice by visiting a website maintained by an academic department. Participants may have received academic advice by communicating with an academic advisor by email. Finally, participants may have obtained academic advice through online or instant messaging style communication with an academic advisor.

The second criterion for being a participant in the present study was having a functional email address. Information about the study and participation in the study was conducted strictly via email; therefore, making it necessary for each participant to have a functional email address.

This study addressed the academic advising needs of undergraduate students. Therefore, the final criterion for being a participant in the study was that each participant be a undergraduate student enrolled in classes full-time.

On January 30, 2006, the academic dean of each academic department was contacted by email (see Appendix A). The email message explained the purpose of the study and asked each department to distribute the link to the online instrument by email to each of their students. On February 1, 2006 a second email message (see Appendix B) was sent to those departments that had not responded asking each department to please respond no later than February 3, 2006. One dean refused to participate in the study. The department heads of the respective academic college were then contacted using the same email.   Many of the departments within the college did agree to participate.

The next step in selecting the sample was to contact the undergraduate students who would participate in the study. Each department that agreed to participate in this forwarded an email requesting student participation in the study to every registered student in the department's undergraduate program. The email described the purpose of the study, explained the time

commitment and responsibilities of the participants, illustrated the expected timeline of the study, and announced the incentives available to any student who chose to participate. If a student chose to participate in the study, the participant would be asked to complete an online survey linked from the email message.

To maximize the response rate, all participants were given the opportunity to enter into a drawing to receive one of three $25 cash prizes. The participants were asked to submit an online entry form upon completion of the survey. Those participants who submitted a form were told that a drawing would take place three days after the conclusion of the data collection period. The three participants whose names were drawn were contacted by email with a time and location to claim their cash prize.

Instrumentation

A slightly modified version of an existing instrument was used for purposes of this study; Winston & Sandor's Academic Advising Inventory (1984, see Appendix C). The Academic Advising Inventory (AAI) provided a formative and summative evaluation of academic advising programs. The formative evaluation of an academic advising program evaluates the process and progress of the academic advising program. The summative evaluation measures the outcome, efficiency, effectiveness, or satisfaction of the academic advising process being evaluated.

The instrument was designed to measure three aspects of academic advising: (a) the type of advising occurring between an advisee and an advisor, (b) the frequency of activities taking place during any academic advising opportunity, and (c) the student's satisfaction with the advising (Winston & Sandor, 2002). The present study made use of the AAI to measure the type of advising received (prescriptive or developmental), the type of information sought through

online academic advising, and the overall satisfaction with the online academic advising experience.

The AAI was divided into four sections or scales: Developmental-Prescriptive Advising (DPA), Advisor-Advisee Activity, Satisfaction with Advising, and Demographics. The DPA consisted of three subscales: Personalizing Education (PE), Academic Decision-Making (ADM), and Selecting Courses (SC). Mean scores derived from these three subscales were used to answer research questions 1, 4, 5, 6, and 7. The Advisor-Advisee Activity Scale consisted of five subscales: Personal Development and Interpersonal Relationships (PDIR), Exploring Institutional Policies (EIP), Registration and Class Scheduling (RCS), Teaching Personal Skills (TPS), and Academic Majors and Courses (AMC). Mean scores from these five subscales were used to answer research questions 2, 8, 9, 10, and 11. The Satisfaction with Advising and the Demographics sections of the AAI did not contain any subscales. Mean scores from the Satisfaction with Advising items were used to answer research questions 3, 12, 13, 14, and 15. The responses from the Demographics items were used to answer research questions 4 through 15.

When creating the instrument, Winston & Sandor began with 62 statements focused on academic advising. Fifty percent of the statements were intended for prescriptive advising and fifty percent of the statements were intended for developmental advising. These statements were intended to represent the contrasting advisor styles defined by Crookston in 1972 (Winston & Sandor, 2002). The 62 statements were randomly ordered and given to eight expert judges. The judges were handpicked because of their thorough research, academic work, and publications based on the field. The judges were asked to identify each item as either prescriptive or developmental. The judges were also asked to provide items that may have been overlooked.

The judges' review of the instrument resulted in the removal of nine items. The next step in the instrument's development was to test the instrument on a group of students (Winston & Sandor, 2002). The results of the pilot test are highlighted in the Reliability and Validity section of this chapter.

The first section of the modified Academic Advising Inventory measured the Developmental-Prescriptive Advising scale. The DPA scale focused on the type of advising being received by the participant. The AAI measured two types of academic advising, prescriptive advising and developmental advising. The section contained 13 items. Each item contained two phrases and required a forced choice by the participant. The participant was asked to read each phrase. Participants were asked to select one statement from each pair of phrases and rate how true they felt that phrase was on a 4-point Likert scale ranging from 'slightly true' to 'very true.' Scoring Part I of the AAI required the recoding of each item. Items 1, 3, 4, 5, 9, and 12 were reverse coded to A=8, B=7, C=6, D=5, E=4, F=3, G=2 and H=1. Items 2, 6, 7, 8, 10, 11, and 13 were reverse coded to A=1, B=2, C=3, D=4, E=5, F=6, G=7 and H=8. The first section of the AAI contained three subscales: Personalizing Education, Academic Decision Making, and Selecting Courses.

The Personalizing Education (PE) subscale contained seven items within Part I of the AAI. The subscale focused on the total education of the student including academic goals, career goals, extracurricular activities, goal setting, use of campus resources, and personal concerns. An example item in this subscale provided participants the option of selecting between two phrases where an advisor guides the student towards their goals or an advisor sets the students' goals for them. High scores ranged between 29 and 56. These scores identified a

developmental advising relationship. Low scores ranged from 7 to 28 and identified a prescriptive advising relationship.

The Academic Decision Making (ADM) subscale contained four items within Part I of the AAI. The subscale focused on the academic-decision making of a student and the role an advisor played in that decision making process. An example item in this subscale provided participants the option of selecting between two phrases where an advisor guides the student on how to register for classes or an advisor registers the student for classes. High scores ranged between 17 and 32. These scores identified a developmental advising relationship. Low scores ranged from 4 to 16 and identified a prescriptive advising relationship.

The Selecting Courses (SC) subscale contained a pair of items within Part I of the AAI. The subscale centered on how a student selected courses and the role an advisor played in that selection process. An example item in this subscale provided participants the option of selecting between two phrases where an advisor helps the student consider a variety of courses to select or an advisor tells the student exactly which courses to select. High scores ranged between 9 and 16. These scores identified a developmental advising relationship. Low scores ranged from 2 to 8 and identified a prescriptive advising relationship.

The second section in the Academic Advising Inventory measured the Advisor-Advisee Activity scales. The Advisor-Advisee Activity scales focused on the types of activities that took place in an advisor-advisee relationship. Part II of the instrument contained 28 items. Each item listed one activity. The participant was asked to select how often they had been involved in each activity with their online academic advising experience during the academic year. The six response options ranged from 'None' to '5 or more times.' Part II of the AAI was scored by calculating the mean scores of the participants' responses for each item in the section.

The Personal Development and Interpersonal Relationships (PDIR) subscale contained 12 items within Part II of the AAI. For example, one item in this subscale asked how often a participant had sought advice concerning personal values during his/her online academic advising sessions.

The Exploring Institutional Policies (EIP) subscale contained five items within Part II of the AAI. An example item in this subscale asked how often a participant had sought advice concerning transfer credits during his/her online academic advising sessions.

The Registration and Class Scheduling (RCS) subscale was composed of four items within Part II of the AAI. For example, one item in this subscale asked how often a participant had sought advice on how to add or drop classes during his/her online academic advising sessions.

The Teaching Personal Skills (TPS) subscale contained three items within Part II of the AAI. An example of one item in this subscale asked how often a participant had sought tips on improving study skills via an online academic advising session.

Finally, the Academic Majors and Courses (AMC) subscale was composed of six items within Part II of the AAI. One item in the subscale asked how often a participant had sought information on course content or major curricula in his/her online academic advising sessions.

The third section in the Academic Advising Inventory measured the participant's satisfaction with the online academic advising opportunity. Part III of the instrument contained five items. Each item was a statement referring to one's satisfaction with various aspects of advising. The participant was asked to read each item and to select how much they agreed with that phrase based on four response options: (a) strongly disagree, (b) disagree, (c) agree, and (d) strongly agree.

The final section of the Academic Advising Inventory recorded the participant's demographic information. Part IV of the AAI contained nine items. The demographic information collected for this study included gender, cultural/racial background, age, academic class standing, academic college, type of residence (resident or commuter), type of online advising experienced, time spent during an online academic advising opportunity, and number of online academic advising sessions participated in over a 6-month period of time. The language within the AAI was modified slightly to reflect the participants' online academic advising experiences. In the modified instrument, every instance of the term "advisor" was substituted with the phrase "online advising." This substitution was made to further clarify the online academic advising experience being evaluated by the study. This substitution in language was believed to have little or no effect on the reliability or validity of the instrument. A copy of the AAI employed in this study appears in Appendix C.

<div align="center">Reliability and Validity</div>

After designing and pilot testing the Academic Advising Inventory, Winston and Sandor (1984) completed three studies to measure the reliability and validity of the instrument. Each study made use of a different student sample. The student sample used to examine the reliability of the Descriptive-Prescriptive Advising Scale and its subscales (Part I) featured a student sample consisting of traditional aged undergraduate students (18-25). The study measuring the validity of the AAI included two student samples; a group of students thought to be receiving developmental advising and a group of students thought to be receiving prescriptive advising.

Reliability

Reliability relates to the extent to which an instrument consistently measures a phenomenon when administered to different groups of people or administered at different times

(Gall, Borg, & Gall, 1996). The Cronbach Alpha procedure was used to estimate the internal consistency reliability for the Developmental-Prescriptive Advising Scale and its subscales: (a) Personalizing Education (PE), (b) Academic Decision-Making (ADM), and (c) Selecting Courses (SC). The alpha coefficients for the procedure ranged from .42 for the SC subscale to .81 for the PE subscale. The alpha coefficient for the total Developmental-Prescriptive Advising Scale was estimated to be .78 (Winston & Sandor, 2002).

In an effort to determine the independence among the subscales, Winston and Sandor conducted Pearson-product correlations among the subscales and the total scales. To determine whether demographic variables produced statistical differences in the reliability among groups, t-tests and analyses of variance were conducted. The correlations between the subscales and major scales varied from .02 to .87. The results of the correlation and parametric statistical tests showed that the subscales are relatively stable, homogeneous, and independent measures (Winston & Sandor, 2002).

Validity

Validity refers to the extent to which an instrument measures the phenomenon it was intended to measure (Gall, Borg, & Gall, 1996). Winston and Sandor evaluated the validity of the Developmental-Prescriptive Advising (DPA) Scale in two ways: contrasted groups and correlations between Part I and activities in Part II of the AAI. The validity of the instrument was supported using the correlation of two contrasting groups that both completed the instrument. The first group was thought to be a developmentally advised group. The second group of participants was thought to be a less developmentally advised group. Students in the first group participated in the Developmental Studies Division and met in a class setting two times per week and periodically met privately with their advisor. The second group of students

consisted of regularly admitted freshmen students who received advising through the College of Arts and Sciences Advising Center or through departmental faculty members. Those students in the second group reported meeting with an advisor only once a quarter for less than 30 minutes (Winston & Sandor, 2002).

Winston and Sandor predicted that the students in the first group would perceive the advising they received as more developmental than the students in the second group. Data were collected from 53 students in the first group and 74 students in the second group. The results of the study show that students in the first group, the Developmental Studies group, scored higher than the regularly admitted freshman in the second group on the DPA scale, the PE subscale, and the SC subscale. Nonetheless, the scores of the two groups were only statistically significantly different on the DPA and PE scales ($p < .001$). The significant differences may be taken as providing support for the validity of the DPA and PE scales. Winston and Sandor could not determine the reason for the absence of statistically significant difference on the other subscales, but they predicted that the cause may be the similarity in approach between the Developmental Studies and the advisors of regularly admitted students when helping students select courses (Winston & Sandor, 2002).

The second method for establishing the validity of the Developmental-Prescriptive Advising scale was to correlate the scale and its subscales with the Activity Scales in Part II of the Academic Advising Inventory. The Activity Scales were correlated with the scales in Part I and the five satisfaction items in Part III of the AAI. The highest correlations were found between the overall DPA scale and the Personalizing Education scale and between the DPA scale and the PDIR scale (.59 and .49 respectively). Finally, there was a relatively high correlation between overall satisfaction and how developmental the advising relationship was perceived to

be by the student. The correlation supports the fact that the more developmental the advising relationship, the greater the level of satisfaction for the student (Winston & Sandor, 2002).

In summary, the Academic Advising Inventory was found to have sufficient validity in measuring the type of advising received by the student and the level of satisfaction that student possess with the advising relationship. The results yielded by the AAI are reliable regardless of the group or time of administration. The results are also valid to measure the type of advising and the student satisfaction with that advising. Therefore, use of the AAI in research, including this study, can be completed with a reasonable amount of certainty that the results will be meaningful.

<div align="center">Data Collection Procedures</div>

Before collecting any data, I requested and received approval from the Institutional Review Board (IRB) for Research Involving Human Subjects at the campus where the study was conducted. Once IRB approval was obtained, the data collection portion of the study began.

On January 16, 2006 the Academic Advising Inventory was uploaded from the standard paper format into an interactive online format. The first screen of the online AAI restated the purpose of the study, explained that any participant may choose to withdraw at any time, and requested the consent of the participant. If the participant chose to participate then they were immediately forwarded to the online AAI. If the participant did not choose to consent then they were immediately transferred to a screen thanking them for their interest in the study.

The online survey featured clickable radio buttons that the participants used to answer each question. Participants scrolled down the screen as they completed each question. After all the questions was answered, the participant submitted the AAI by clicking on a submit button located at the bottom of the survey. After clicking on the button, the participant was forwarded

to a final page thanking them for their participation and offering them the opportunity to register for the cash prize incentive.

If they wanted to register for the cash incentive, participants were led to a registration page. On that page, the participant was asked to provide a personal email address if they wished to be entered into the cash prize drawing. The participant entered the email address into a text box on the screen and then clicked on a submit button to enter the drawing. After entering the drawing, participants were transferred to a screen thanking them for their participation and providing the contact information of the researcher in case they had questions. If participants chose to not enter into the drawing, then they were transferred to a web page thanking them for their participation in the study and providing the contact information of the researcher in case they had questions. The incentive registration was kept separate from the consent form and online AAI to protect the anonymity of the participants.

On January 30, 2005 the dean of each academic college was sent an email (see Appendix A) message asking them to send an email (see Appendix D) containing a link to the online AAI to each student in the college. The email message to potential participants (see Appendix A) informed them of the purpose of the study and explained that each student who willingly participated in the study would be offered the opportunity to enter into a drawing for one of three $25 cash prizes.

Three days after sending the initial electronic mail message to deans of academic colleges (see Appendix A), a second electronic mail message was sent to the participating deans for dissemination to all students within the academic college. The second electronic mail message (see Appendix D) reiterated the purpose of the study, reminded students that each participant was eligible to be entered into a drawing for a cash prize, and provided the link to the online

Academic Advising Inventory. This message also announced that the final date to participate in

the study was February 20, 2006.

Two weeks after notifying students of the opportunity to participate in the study, the

online Academic Advising Inventory was closed (February 20, 2006).   The email address of

each participant who chose to enter into the drawing was printed on equal sizes of paper, folded

in half, and placed into a large box. Three of the folded pieces of paper were drawn at random

from the box by my advisor. Those people whose email addresses were listed on the three

selected pieces of paper were notified by email that they were the winners of one of the three $25

cash prizes. The winners were asked to pick up their prize from me at a designated time and

place.

<center>Data Analysis Procedures</center>

Once the Academic Advising Inventory online surveys were completed, they were

analyzed to address the research questions posed in this study. Data collected through the AAI

provided a set of quantifiable data that the researcher analyzed to address each of the research

questions.

The first research question addressed the type of academic advising students received

online (prescriptive v. developmental). Part I of the AAI contained 13 items. The response

options in Part I of the instrument ranged from 1-8. Participant responses closer to 1 illustrated a

bias towards a prescriptive advising style. Participant responses closer to 8 illustrated a bias

towards a developmental advising style. To answer the question, data was analyzed on the

Academic Advising Inventory's Developmental-Prescriptive Advising (DPA) scale. First, the

researcher recoded all the responses in Part I of the AAI along a scale of 1-8. These coded

responses served as the range for all items for all participants.   The range of scores varied from

13 to 104. Next, the researcher calculated the mean and standard deviation for all items for all participants. These descriptive statistics were used to answer the first research question.

The second research question focused on the type of information students sought when receiving academic advising online. Section II of the AAI contained 28 items. The response items in Part II of the AAI ranged from A to F. The closer the response was to A the less the participant participated in that type of activity when seeking online academic advising. To answer the question, the researcher analyzed data on the AAI's Advisor-Advisee Scales. The mean score and standard deviation was calculated for each item for all participants. Descriptive statistics were used to answer the second research question.

The third research question addressed the level of satisfaction students experienced when seeking online academic advising. Part III of the AAI contained five items and featured response options ranging from A to D. Those participants selecting a response of A disagreed with the statement. Those participants selecting a response of D agreed with the statement. The response options between A and D were for those participants whose choice of response fell between complete agreement and complete disagreement. To answer this question, the researcher analyzed data on Part III of the Academic Advising Inventory. The mean scores of each item were used to answer the third research question.

The fourth research question addressed the preferences in advising style by gender. To answer the question, data were analyzed on the Academic Advising Inventory's Developmental-Prescriptive Advising (DPA) scale. First, the researcher recoded all the responses in Part I of the AAI along a scale of 1-8. These coded responses served as the range for all items for all participants. Then, I separated the participants into two groups: male and female. Next, I

calculated the mean and standard deviation for each item for each group. Finally, a T-test was conducted to compare the mean scores between the male group and the female group ($p < .05$).

The fifth research question addressed the different preferences in advising style based on the participant's type of residence. The data were analyzed the same way they were analyzed to answer the fourth research question. However, instead of dividing the participants into two groups by sex the participants were divided into two groups based on type of residence: resident or commuter.

The next research question addressed the different preferences in advising style based on the participant's race. The data were analyzed the same way they were analyzed to answer the fourth and fifth research questions. Instead of dividing the participants into two groups by sex or residence type, the participants were initially divided into seven groups based on race: African-American/Black, Hispanic American/Latino, Asian American/Pacific Islander, Native American, White/Caucasian, Biracial/multiracial, and Other. However, due to the lack of minority participants, the categories were collapsed into two groups to allow for a T-test analysis to be conducted on the data. The categories were collapsed into majority and minority. Minority responses were those respondents who did identify themselves as White/Caucasian.

The seventh research question addressed the different preferences in advising style based on the participant's academic college. Instead of dividing the participants into two groups by sex or residence type, the participants were divided into eight groups based on academic college: Agriculture/Life Sciences, Architecture/Urban Studies, Business, Engineering, Liberal Arts, Natural Resources, Science, and Transient Student. The means scores of each college were analyzed using an ANOVA test followed by a Tukey HSD post-hoc comparison.

The next research question addressed the different types of information sought in advising based on gender. To answer the question, data were analyzed on the Academic Advising Inventory's Advisor-Advisee scales. First, the researcher separated the participants into two groups: male or female. Then, the mean score of each response was calculated for each item for each group. The data were analyzed using the five subscales that exist within the instrument. This analysis provided the different types of information that the students sought online. The items within each scale were summed per group. Next, the mean score and standard deviation were calculated within each scale for both groups. Finally, a T-test was conducted between the male group and the female group to compare the frequency data and to determine if the type of information sought by students differed based on the gender of the student.

The ninth research question addressed the different types of information sought in advising based on the participant's type of residence. The data were analyzed the same way they were analyzed to answer the previous research question. However, instead of dividing the participants into two groups by gender the participants were divided into two groups based on type of residence: resident or commuter.

The tenth research question addressed the different types of information sought in advising based on the participant's race. The data were analyzed the same way they were analyzed to answer the previous research question. Instead of dividing the participants into two groups by sex or residence type, the participants were divided into seven groups based on race: African-American/Black, Hispanic American/Latino, Asian American/Pacific Islander, Native American, White/Caucasian, Biracial/multiracial, and Other. However, due to the lack of minority participants, the categories were collapsed into two groups to allow for a T-test analysis

to be conducted on the data. The categories were collapsed into majority and minority. Minority responses were those respondents who did identify themselves as White/Caucasian.

The next research question addressed the different types of information sought in advising based on the participant's academic college. The data were analyzed the same way they were analyzed to answer the three previous research questions. However, instead of dividing the participants into two groups by sex or residence type, the participants were divided into eight groups based on academic college: Agriculture/Life Sciences, Architecture/Urban Studies, Business, Engineering, Liberal Arts, Natural Resources, Science, and Transient Student. The means scores of each college were analyzed using an ANOVA test followed by a Tukey HSD post-hoc comparison.

Research question number 12 focused on the different levels of satisfaction experienced by students based on the gender of the participant. To answer the question, data were analyzed on Part III of the Academic Advising Inventory. First, the researcher separated the participants into two groups: male or female. Next, the frequency with which each group selects each response option for each item was calculated. After calculating the mean score and standard deviation for each group, a T-test was conducted between the male group and the female group to compare the frequency data.

The next research question focused on the different levels of satisfaction experienced by students based on the participant's type of residence. The data were analyzed the same way they were analyzed to answer the previous research question. However, instead of dividing the participants into two groups by gender the participants were divided into two groups based on type of residence: resident or commuter.

The next research question focused on the different levels of satisfaction experienced by students based on the participant's race. The data were analyzed the same way they were analyzed to answer the previous two research questions. Instead of dividing the participants into two groups by sex or residence type, the participants were divided into seven groups based on race: African-American/Black, Hispanic American/Latino, Asian American/Pacific Islander, Native American, White/Caucasian, Biracial/multiracial, and Other. However, due to the lack of minority participants, the categories were collapsed into two groups to allow for a T-test analysis to be conducted on the data. The categories were collapsed into majority and minority. Minority responses were those respondents who did identify themselves as White/Caucasian.

The final research question focused on the different levels of satisfaction experienced by students based on the participant's academic college. The data were analyzed the same way they were analyzed to answer the previous three research questions. However, instead of dividing the participants into two groups by sex or residence type, the participants were divided into eight groups based on academic college: Agriculture/Life Sciences, Architecture/Urban Studies, Business, Engineering, Liberal Arts, Natural Resources, Science, and Transient Student. The means scores of each college were analyzed using an ANOVA test followed by a Tukey HSD post-hoc comparison.

In conclusion, gathering data through the use of an online Academic Advising Inventory helped in obtaining a wide range of participant responses and allowed for the topic to be explored from many participant perspectives. The methods of data collection and data analysis that were used enabled the researcher to answer the research questions presented in the study.

CHAPTER FOUR

RESULTS

The purpose of this chapter is to report the results of the data analysis. The chapter is organized into two sections. The first section provides a description of the sample. The second section describes the analysis of the data with regards to each research question posed in the study. Section two is organized into three subsections: (a) type of advising, (b) type of information, and (c) overall satisfaction with online advising. Specifically, this study was designed to address the following questions:

1. What type of advising, prescriptive or developmental, do undergraduate students receive when seeking online academic advising?

2. What type of information do undergraduate students seek from online academic advising?

3. How satisfied are undergraduate students with their online academic advising experience?

4. How does the type of advising obtained via online academic advising vary by gender?

5. How does the type of advising obtained via online academic advising vary by type of residence (resident or commuter)?

6. How does the type of advising obtained via online academic advising vary by race?

7. How does the type of advising obtained via online academic advising vary by academic college?

8. How does the type of information obtained via online academic advising vary by gender?

9. How does the type of information obtained via online academic advising vary by type of residence?

10. How does the type of information obtained via online academic advising vary by race?

11. How does the type of information obtained via online academic advising vary by academic college?

12. How does satisfaction with online academic advising vary by gender?

13. How does satisfaction with online academic advising vary by type of residence?

14. How does satisfaction with online academic advising vary by race?

15. How does satisfaction with online academic advising vary by academic college?

Description of the Respondents

A total of 320 surveys were returned. Given the undergraduate population of the institution studied, this represents a response rate 0f 1.5%. Since I depended upon deans and departments heads to contact students, I cannot be sure if each student was contacted successfully. This limitation will be discussed further in the next chapter. Each participant was an undergraduate student enrolled full-time at a large mid-Atlantic research institution. The demographic characteristics of the sample are reported according to gender, age, race, class standing, academic college, and type of residency in Table 1. For each characteristic, some participants did not provide a response, and therefore sums do not total 320 in some instances.

Approximately half (44.4%) of the participants were male and half (52.4%) were female. The age of participants was divided between the ages of 18 (26.3%), 19 (24.1%), 20 (17%), and 21 years old (17%). The respondents were also divided into majority and minority ethnic groups. Majority was defined as White. Minority was defined as those indicating African

Table 1

Demographic Characteristics of the Sample (N = 320)

Characteristics	n	%N [+]
Sex		
Male	142	44.4
Female	168	52.5
Age		
18 or younger	84	26.3
19	77	24.1
20	54	16.9
21	54	16.9
22	32	10.0
23+	12	3.8
Race		
Majority	254	79.4
Minority	60	18.8
Class Standing		
Freshman	108	33.8
Sophomore	66	20.6
Junior	64	20.0
Senior	72	22.5
Academic College		
Agriculture & Life Sciences	11	3.4
Architecture & Urban Studies	9	2.8
Business	104	32.5
Engineering	75	23.4
Liberal Arts & Human Sciences	17	5.3
Natural Resources	31	9.7
Science	17	5.3
University Studies	51	15.9
Type of Residency		
On Campus	215	67.2
Not on Campus	100	31.2

[+] Note: Percentages may not add up to 100 due to missing data

American, Asian-American, Biracial/Multiracial, Hispanic American/Latino, or Other. Seventy-.nine percent (79%) of the participants identified themselves as members of the majority. Nineteen percent (19%) of the participants identified themselves as members of a minority.

Additionally, the respondents were grouped by class standing, academic college, and whether or not they lived on campus. It consisted of 34% freshmen, 21% sophomore, 20% juniors, and 23% seniors. Seventy-two percent (72%) of the participants were either members of the College of Engineering, College of Business, or University Studies. Sixty-seven percent (67%) of respondents lived on campus. Thirty-one percent (31%) of the sample did not live on campus.

<div align="center">Type of Advising</div>

The first research question sought to identify the type of advising (developmental or prescriptive) received by participants when receiving academic advice online. To address this question, the researcher calculated descriptive statistics for the overall scores in each of the four scales represented in Part I of the Online Academic Advising Inventory. The results are summarized in Table 2. Each question on the OAAI related to one of the four scales, and students were asked to make two decisions: (a) which statement (A or B) related most closely to their experiences and (b) based on the statement they selected, was the statement slightly true, somewhat true, true, or very true. Participants who scored at the high end of each scale were recorded to have received developmental advising within that scale. Participants who scored low on each scale were recorded to have received prescriptive advising within that scale.

To analyze the type of advising received, the total score was calculated per scale for each participant. Then, the mean score was calculated among all participants for each of the four scales: (a) Developmental-Prescriptive Advising (DPA), b) Personalizing Education (PE),

Table 2

Type of Advising Received during Online Academic Advising (N = 320)

Scale	n	m	s.d.
Developmental - Prescriptive Advising (DPA)	320	60.67	12.61
Personalizing Education (PE)	320	27.67	8.21
Academic Decision Making (ADM)	320	21.38	4.49
Selecting Courses (SC)	320	11.62	2.87

(c) Academic Decision Making (ADM), and d) Selecting Courses (SC). The number of items per scale varied. Therefore, the range of mean scores varied based on the number of items dedicated to each scale. The DPA scale contained all 13 items. The scores ranged from 13 to 104. The three subscales each contained a portion of the items. The PE subscale contained seven items. The scores ranged from 7 to 56. The ADM subscale contained four items. The scores ranged from 4 to 32. Finally, the SC subscale contained two items and had a range from 2 to 16.

The data indicated that participants received developmental advising on three of the four scales. Those scales were the DPA scale (m = 60.67), the ADM subscale (m = 21.38), and the SC subscale (m = 11.62). The data also indicated that respondents received prescriptive advising on the PE subscale (m = 27.67).

Differences by Gender

The fourth research question posed in the study examined whether there were differences by gender in the type of advising received online. A t-test was run on each of the four scales, comparing the mean scores of male participants to the mean scores of female participants. Results of the t-test are reported in Table 3. A significant difference (p < .05) was found on the Academic Decision Making scale and the Selecting Courses scale. Female participants reported receiving developmental advising more often than male participants. It should also be noted that a significance of 0.08 was found on the Developmental-Prescriptive Advising scale. Although this finding is not statistically significant, the probability merits further research to determine why female students report receiving developmental advising more than male students.

Differences by Residence

Table 3

Results of T-tests on Differences in Type of Advising by Gender (N = 320)[+]

Scale	Gender of Participants	n	m	s.d.	df	F	p
Developmental - Prescriptive Advising (DPA)					1	1.73	0.08
	Male	142	61.26	11.61			
	Female	168	63.55	11.46			
Personalizing Education (PE)					1	0.31	0.75
	Male	141	30.25	8.04			
	Female	168	29.96	8.37			
Academic Decision Making (ADM)					1		
	Male	141	20.55	4.85		2.30	0.02*
	Female	168	21.72	4.09			
Selecting Courses (SC)					1	3.30	0.00*
	Male	141	10.81	3.11			
	Female	168	11.88	2.56			

[+] n may not equal 320 due to missing data

* significant at the p < 0.05 level

The fifth research question posed in the study examined whether there were differences by type of residence (on-campus or not on-campus) in the type of advising received online. A t-test was run on each of the four scales, comparing the mean scores of on-campus participants to the mean scores of participants who did not live on campus. Results of the t-test are reported in Table 4. No significant differences were found between the type of advising received by on campus participants and participants not living on campus. The type of residency did not seem to influence the type of advising received.

Differences by Race

The sixth research question posed in the study examined whether there were differences by race in the type of advising received online. A t-test was run on each of the four scales, comparing the mean scores of majority participants to the mean scores of participants who identified themselves as minorities. Results of the t-test are reported in Table 5. A significant difference ($p < .05$) was found on the Academic Decision Making scale and the Selecting Courses scale. Majority participants reported receiving developmental advising more often than minority participants. It should also be noted that a significance of 0.11 was found on the Developmental-Prescriptive Advising scale. Majority participants reported receiving developmental advising more often than minority participants here too. Although the finding is not statistically significant, the probability merits further research to determine why minority students report receiving prescriptive advising online more than majority students.

Differences by Academic College

The seventh research question posed in the study examined whether there were differences by academic college in the type of advising received online. Two statistical tests were used to analyze the data. First, an ANOVA was run on each of the four scales, comparing

Table 4

Results of T-tests on Differences in Type of Advising by Residency (N = 320)[+]

Scale	Residency of Participants	n	m	s.d.	df	F	p
Developmental - Prescriptive Advising (DPA)					1	0.76	0.44
	On Campus	215	62.86	11.69			
	Off Campus	100	61.78	11.53			
Personalizing Education (PE)					1	0.17	0.86
	On Campus	215	30.15	8.36			
	Off Campus	99	29.98	7.92			
Academic Decision Making (ADM)					1	0.27	0.79
	On Campus	215	21.24	4.50			
	Off Campus	99	21.09	4.47			
Selecting Courses (SC)					1	0.77	0.44
	On Campus	215	11.47	2.78			
	Off Campus	99	11.20	0.04			

[+] n may not equal 320 due to missing data

Table 5

Results of T-tests on Differences in Type of Advising by Race (N = 320)[+]

Scale	Race of Participants	n	m	s.d.	df	F	p
Developmental - Prescriptive Advising (DPA)					1	1.57	0.11
	Majority	254	63.25	11.74			
	Minority	51	60.43	11.25			
Personalizing Education (PE)					1	0.26	0.79
	Majority	253	30.35	8.07			
	Minority	51	30.01	8.82			
Academic Decision Making (ADM)					1	2.13	0.03*
	Majority	253	21.48	4.45			
	Minority	51	20.02	4.57			
Selecting Courses (SC)					1	2.76	0.01*
	Majority	253	11.61	2.79			
	Minority	51	10.39	3.26			

[+] n may not equal 320 due to missing data

* significant at the p < 0.05 level

the mean scores of participants from eight different academic colleges to one another. Second, the Tukey HSD post hoc test was used to determine which colleges significantly differed from one another. A summary of the ANOVA results is presented in Table 6. A summary of the Tukey HSD results is presented in Table 7. A significant difference ($p < .05$) was found on the Developmental-Prescriptive Advising scale. The Tukey HSD results showed that participants from the College of Business (m = 59.46) reported receiving developmental advising less than participants from the College of Natural Resources (m = 68.29) and University Studies (m = 66.94).

The Tukey HSD results also reported significant differences between three colleges on the Personalizing Education subscale. Participants from the College of Business (m = 28.2) received developmental advising less often than respondents from the College of Natural Resources (m = 33.19) and University Studies (m = 33.86). In addition, a significant difference was discovered between participants from the College of Engineering and University Studies. Again, respondents from University Studies (m = 33.86) reported that they received more developmental advising than participants from the College of Engineering (m = 29.47). It should also be noted that a significance of 0.06 was found on the Selecting Courses subscale. Participants from the College of Natural Resources (m = 12.71) reported receiving developmental advising more often than the participants from the College of Engineering (m = 10.89). Although the finding is not statistically significant, the probability merits further research to determine if the online academic advice provided by the College of Natural Resources provides more opportunity for self-development than the methods provided by the College of Engineering. Finally, the Tukey HSD post hoc test returned zero significant differences between colleges on the Academic Decision Making subscale.

Table 6

Results of ANOVA on Differences in Type of Advising by Academic College (N = 315)[+]

Scale	College of Participants	n	m	s.d.	df	F	p
Developmental - Prescriptive Advising (DPA)					7	3.89	0.00*
	Agriculture & Life Sciences	11	60.18	14.25			
	Architecture & Urban Studies	9	60.88	15.50			
	Business	104	59.46	10.91			
	Engineering	75	61.65	10.03			
	Liberal Arts & Human Sciences	17	60.06	12.17			
	Natural Resources	31	68.29	11.67			
	Science	17	66.06	12.83			
	University Studies	51	66.94	11.21			
Personalizing Education (PE)					7	3.90	0.00*
	Agriculture & Life Sciences	11	26.64	8.30			
	Architecture & Urban Studies	9	28.11	8.90			
	Business	103	28.2	7.21			
	Engineering	75	29.47	8.06			
	Liberal Arts & Human Sciences	17	28.41	9.17			
	Natural Resources	31	33.19	8.1			
	Science	15	32.41	9.89			
	University Studies	51	33.86	7.82			
Academic Decision Making (ADM)					7	0.87	0.53
	Agriculture & Life Sciences	11	21.73	4.20			
	Architecture & Urban Studies	9	22.44	6.11			
	Business	103	20.49	4.08			
	Engineering	75	21.29	4.31			
	Liberal Arts & Human Sciences	17	20.65	4.83			
	Natural Resources	31	22.39	5.30			
	Science	15	21.65	3.26			
	University Studies	51	21.41	4.94			
Selecting Courses (SC)					7	1.77	0.09
	Agriculture & Life Sciences	11	11.82	3.76			
	Architecture & Urban Studies	9	10.33	2.45			
	Business	103	11.21	2.62			
	Engineering	75	10.89	3.24			
	Liberal Arts & Human Sciences	17	11.00	2.67			
	Natural Resources	31	12.71	2.55			
	Science	15	12.00	2.09			
	University Studies	51	11.67	2.94			

[+] n may not equal 320 due to missing data

* significant at the p < 0.05 level

Table 7

Results of Tukey HSD on Differences in Type of Advising by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Developmental - Prescriptive Advising (DPA)				
	Agriculture & Life Sciences	Architecture & Urban Studies	0.71	1.00
		Business	0.72	1.00
		Engineering	1.47	1.00
		Liberal Arts & Human Sciences	0.12	1.00
		Natural Resources	8.12	0.45
		Science	5.88	0.88
		University Studies	6.76	0.62
	Architecture & Urban Studies	Agriculture & Life Sciences	0.71	1.00
		Business	1.42	1.00
		Engineering	0.76	1.00
		Liberal Arts & Human Sciences	0.83	1.00
		Natural Resources	7.40	0.67
		Science	5.17	0.95
		University Studies	6.05	0.82
	Business	Agriculture & Life Sciences	0.72	1.00
		Architecture & Urban Studies	1.43	1.00
		Engineering	2.19	0.91
		Liberal Arts & Human Sciences	0.60	1.00
		Natural Resources	8.83	0.00*
		Science	6.60	0.33
		University Studies	7.48	0.00*
	Engineering	Agriculture & Life Sciences	1.47	1.00
		Architecture & Urban Studies	0.76	1.00
		Business	2.19	0.91
		Liberal Arts & Human Sciences	1.59	1.00
		Natural Resources	6.64	0.11
		Science	4.41	0.83
		University Studies	5.29	0.17

* significant at the p < 0.05 level

Table 7 (cont.)

Results of Tukey HSD on Differences in Type of Advising by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Developmental - Prescriptive Advising (DPA)				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	0.12	1.00
		Architecture & Urban Studies	0.83	1.00
		Business	0.60	1.00
		Engineering	1.59	1.00
		Natural Resources	8.23	0.24
		Science	6.00	0.78
		University Studies	6.88	0.37
	Natural Resources	Agriculture & Life Sciences	8.11	0.45
		Architecture & Urban Studies	7.40	0.67
		Business	8.83	0.00*
		Engineering	6.64	0.11
		Liberal Arts & Human Sciences	8.23	0.24
		Science	2.23	1.00
		University Studies	1.35	1.00
	Science	Agriculture & Life Sciences	5.88	0.88
		Architecture & Urban Studies	5.17	0.95
		Business	6.60	0.33
		Engineering	4.41	0.83
		Liberal Arts & Human Sciences	6.00	0.78
		Natural Resources	2.23	1.00
		University Studies	0.88	1.00
	University Studies	Agriculture & Life Sciences	6.76	0.62
		Architecture & Urban Studies	6.05	0.82
		Business	7.48	0.00*
		Engineering	5.29	0.17
		Liberal Arts & Human Sciences	6.88	0.37
		Natural Resources	1.35	1.00
		Science	0.88	1.00

* significant at the p < 0.05 level

Table 7 (cont.)

Results of Tukey HSD on Differences in Type of Advising by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Personalizing Education (PE)	Agriculture & Life Sciences	Architecture & Urban Studies	1.47	1.00
		Business	1.57	1.00
		Engineering	2.83	0.96
		Liberal Arts & Human Sciences	1.78	1.00
		Natural Resources	6.56	0.27
		Science	5.78	0.57
		University Studies	7.23	0.12
	Architecture & Urban Studies	Agriculture & Life Sciences	1.47	1.00
		Business	0.09	1.00
		Engineering	1.36	1.00
		Liberal Arts & Human Sciences	0.30	1.00
		Natural Resources	5.08	0.70
		Science	4.30	0.89
		University Studies	5.75	0.48
	Business	Agriculture & Life Sciences	1.57	1.00
		Architecture & Urban Studies	0.09	1.00
		Engineering	1.26	0.97
		Liberal Arts & Human Sciences	0.21	1.00
		Natural Resources	4.99	0.05*
		Science	4.21	0.47
		University Studies	5.66	0.00*
	Engineering	Agriculture & Life Sciences	2.83	0.96
		Architecture & Urban Studies	1.36	1.00
		Business	1.26	0.97
		Liberal Arts & Human Sciences	1.05	1.00
		Natural Resources	3.73	0.36
		Science	2.95	0.87
		University Studies	4.40	0.05*

* significant at the p < 0.05 level

Table 7 (cont.)

Results of Tukey HSD on Differences in Type of Advising by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Personalizing Education (PE)	Liberal Arts & Human Sciences	Agriculture & Life Sciences	1.77	1.00
		Architecture & Urban Studies	0.30	1.00
		Business	0.21	1.00
		Engineering	1.05	1.00
		Natural Resources	4.78	0.49
		Science	4.00	0.83
		University Studies	5.45	0.22
	Natural Resources	Agriculture & Life Sciences	6.56	0.27
		Architecture & Urban Studies	5.08	0.70
		Business	4.99	0.05*
		Engineering	3.72	0.36
		Liberal Arts & Human Sciences	4.78	0.49
		Science	0.78	1.00
		University Studies	0.67	1.00
	Science	Agriculture & Life Sciences	5.78	0.57
		Architecture & Urban Studies	4.30	0.89
		Business	4.21	0.47
		Engineering	2.95	0.87
		Liberal Arts & Human Sciences	4.00	0.83
		Natural Resources	0.78	1.00
		University Studies	1.45	1.00
	University Studies	Agriculture & Life Sciences	7.23	0.12
		Architecture & Urban Studies	5.75	0.48
		Business	5.66	0.00*
		Engineering	4.40	0.05*
		Liberal Arts & Human Sciences	5.45	0.22
		Natural Resources	0.67	1.00
		Science	1.45	1.00

* significant at the p < 0.05 level

Table 7 (cont.)

Results of Tukey HSD on Differences in Type of Advising by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Academic Decision Making (ADM)	Agriculture & Life Sciences	Architecture & Urban Studies	0.72	1.00
		Business	1.23	0.99
		Engineering	0.42	1.00
		Liberal Arts & Human Sciences	1.08	1.00
		Natural Resources	0.66	1.00
		Science	0.08	1.00
		University Studies	0.32	1.00
	Architecture & Urban Studies	Agriculture & Life Sciences	0.72	1.00
		Business	1.95	0.92
		Engineering	1.15	1.00
		Liberal Arts & Human Sciences	1.80	0.98
		Natural Resources	0.06	1.00
		Science	0.80	1.00
		University Studies	1.03	1.00
	Business	Agriculture & Life Sciences	1.23	0.99
		Architecture & Urban Studies	1.95	0.92
		Engineering	0.80	0.94
		Liberal Arts & Human Sciences	0.15	1.00
		Natural Resources	1.89	0.45
		Science	1.15	0.98
		University Studies	0.92	0.93
	Engineering	Agriculture & Life Sciences	0.43	1.00
		Architecture & Urban Studies	1.15	1.00
		Business	0.80	0.94
		Liberal Arts & Human Sciences	0.65	1.00
		Natural Resources	1.09	0.95
		Science	0.35	1.00
		University Studies	0.12	1.00

Table 7 (cont.)

Results of Tukey HSD on Differences in Type of Advising by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Academic				
Decision Making (ADM)	Liberal Arts & Human Sciences	Agriculture & Life Sciences	1.08	1.00
		Architecture & Urban Studies	1.80	0.98
		Business	0.15	1.00
		Engineering	0.65	1.00
		Natural Resources	1.74	0.90
		Science	1.00	1.00
		University Studies	0.76	1.00
	Natural Resources	Agriculture & Life Sciences	0.66	1.00
		Architecture & Urban Studies	0.06	1.00
		Business	1.89	0.45
		Engineering	1.09	0.95
		Liberal Arts & Human Sciences	1.74	0.90
		Science	0.74	1.00
		University Studies	0.98	0.98
	Science	Agriculture & Life Sciences	0.08	1.00
		Architecture & Urban Studies	0.80	1.00
		Business	1.15	0.98
		Engineering	0.35	1.00
		Liberal Arts & Human Sciences	1.00	1.00
		Natural Resources	0.74	1.00
		University Studies	0.24	1.00
	University Studies	Agriculture & Life Sciences	0.32	1.00
		Architecture & Urban Studies	1.03	1.00
		Business	0.92	0.93
		Engineering	0.12	1.00
		Liberal Arts & Human Sciences	0.76	1.00
		Natural Resources	0.98	0.98
		Science	0.24	1.00

Table 7 (cont.)

Results of Tukey HSD on Differences in Type of Advising by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Selecting Courses (SC)				
	Agriculture & Life Sciences	Architecture & Urban Studies	1.48	0.94
		Business	0.60	1.00
		Engineering	0.92	0.97
		Liberal Arts & Human Sciences	0.82	1.00
		Natural Resources	0.89	0.99
		Science	0.18	1.00
		University Studies	0.15	1.00
	Architecture & Urban Studies	Agriculture & Life Sciences	1.48	0.94
		Business	0.88	0.99
		Engineering	0.56	1.00
		Liberal Arts & Human Sciences	0.67	1.00
		Natural Resources	2.38	0.35
		Science	1.67	0.84
		University Studies	1.33	0.90
	Business	Agriculture & Life Sciences	0.60	1.00
		Architecture & Urban Studies	0.88	0.99
		Engineering	0.32	1.00
		Liberal Arts & Human Sciences	0.21	1.00
		Natural Resources	1.50	0.17
		Science	0.79	0.97
		University Studies	0.45	0.98
	Engineering	Agriculture & Life Sciences	0.92	0.97
		Architecture & Urban Studies	0.56	1.00
		Business	0.32	1.00
		Liberal Arts & Human Sciences	0.11	1.00
		Natural Resources	1.82	0.06
		Science	1.11	0.83
		University Studies	0.77	0.81

Table 7 (cont.)

Results of Tukey HSD on Differences in Type of Advising by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Selecting Courses (SC)				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	0.82	1.00
		Architecture & Urban Studies	0.67	1.00
		Business	0.21	1.00
		Engineering	0.11	1.00
		Natural Resources	1.71	0.50
		Science	1.00	0.97
		University Studies	0.67	0.99
	Natural Resources	Agriculture & Life Sciences	0.89	0.99
		Architecture & Urban Studies	2.38	0.35
		Business	1.50	0.17
		Engineering	1.82	0.06
		Liberal Arts & Human Sciences	1.71	0.50
		Science	0.71	0.99
		University Studies	1.04	0.75
	Science	Agriculture & Life Sciences	0.18	1.00
		Architecture & Urban Studies	1.67	0.85
		Business	0.79	0.97
		Engineering	1.11	0.83
		Liberal Arts & Human Sciences	1.00	0.97
		Natural Resources	0.71	0.99
		University Studies	0.33	1.00
	University Studies	Agriculture & Life Sciences	0.15	1.00
		Architecture & Urban Studies	1.33	0.90
		Business	0.45	0.98
		Engineering	0.77	0.81
		Liberal Arts & Human Sciences	0.67	0.99
		Natural Resources	1.04	0.75
		Science	0.33	1.00

Type of Information

The second research question sought to identify the type of information participants seek when receiving academic advice online. To address this question, I calculated descriptive statistics for the overall scores in each of the five scales represented in Part II of the Online Academic Advising Inventory. The results are summarized in Table 8. Each question on the OAAI related to one of the five scales. Students responded how often they sought that information from zero to five times. Each scale contained a different number of items. The range for each scale ranged from zero to five. The data indicated that participants sought information from two scales more often than the other scales. Those scales were the Academic Majors and Courses (AMC) scale (m = 1.68) and the Teaching Personal Skills (TPS) scale (m = 1.65).   The importance of this discovery and possible implications are discussed in the final chapter of this study.

Differences by Gender

The eighth research question posed in the study examined whether there were differences by gender in the type of information sought by participants via online academic advising. A t-test was run on each of the five scales, comparing the mean scores of male participants to the mean scores of female participants. Results of the t-test are reported in Table 9. A significant difference (p < .05) was found on the Personal Development and Interpersonal Relationship (PDIR) scale. Male participants (m = 1.33) reported obtaining information on this scale more often than female participants (m = 1.10).

Differences by Residency

The ninth research question posed in the study examined whether there were differences by type of residence (on-campus or not on-campus) in the type of information sought during

Table 8

Type of Information Received during Online Academic Advising (N = 320)

Scale	m	s.d.
Personal Development and Interpersonal Relationships (PDIR)	0.97	0.75
Exploring Institutional Policies (EIP)	1.35	0.59
Registration and Class Scheduling (RCS)	1.55	0.57
Teaching Personal Skills (TPS)	1.65	0.18
Academic Major and Courses (AMC)	1.68	0.68

Table 9

Results of T-tests on Differences in Type of Information by Gender (N = 320)[+]

Scale	Gender of Participants	n	m	s.d.	df	F	p
Personal Development and Interpersonal Relationships (PDIR)					1	2.10	0.04*
	Male	142	1.33	1.06			
	Female	168	1.10	0.90			
Exploring Institutional Policies (EIP)					1	0.24	0.81
	Male	142	1.22	1.03			
	Female	168	1.24	0.93			
Registration and Class Scheduling (RCS)					1	0.15	0.88
	Male	142	2.38	1.29			
	Female	168	2.35	1.35			
Teaching Personal Skills (TPS)					1	0.15	0.88
	Male	142	1.49	1.11			
	Female	168	1.47	1.16			
Academic Major and Courses (AMC)					1	0.02	0.98
	Male	142	1.82	1.22			
	Female	168	1.83	1.08			

+ n may not equal 320 due to missing data

* significant at the p < 0.05 level

online academic advising. A t-test was run on each of the five scales, comparing the mean scores of on-campus participants to the mean scores of participants who did not live on campus. Results of the t-test are reported in Table 10. No significant differences were found between the type of information sought by on campus participants and off-campus participants.

Differences by Race

The tenth research question posed in the study examined whether there were differences by race in the type of information sought during online academic advising. A t-test was run on each of the five scales, comparing the mean scores of majority participants to the mean scores of participants who identified as members of a minority. Results of the t-test are reported in Table 11. No significant differences were found between the type of information sought by majority participants and minority participants.

Differences by Academic College

The eleventh research question posed in the study examined whether there were differences by academic college in the type of information sought by participants receiving academic advice online. Two statistical tests were used to analyze the data. First, an ANOVA was run on each of the five scales, comparing the mean scores of participants from eight different academic colleges to one another. Second, the Tukey HSD post hoc test was used to determine which colleges significantly differed from one another. A summary of the ANOVA results is presented in Table 12. A summary of the Tukey HSD results is presented in Table 13. A significant difference ($p < .05$) was found on the TPS scale. Participants from University Studies ($m = 2.15$) reported that they obtained information from this scale more often than participants from the College of Business ($m = 1.26$), College of Engineering ($m = 1.37$), and

Table 10

Results of T-tests on Differences in Type of Information by Residency (N = 320)[+]

Scale	Residency of Participants	n	m	s.d.	df	F	p
Personal Development and Interpersonal Relationships (PDIR)					1	0.73	0.47
	On Campus	215	1.23	0.99			
	Off Campus	100	1.15	0.95			
Exploring Institutional Policies (EIP)					1	0.83	0.41
	On Campus	215	1.26	0.95			
	Off Campus	100	1.17	1.01			
Registration and Class Scheduling (RCS)					1	0.54	0.59
	On Campus	215	2.4	1.35			
	Off Campus	100	2.31	1.25			
Teaching Personal Skills (TPS)					1	1.80	0.07
	On Campus	215	1.55	1.14			
	Off Campus	100	1.31	1.08			
Academic Major and Courses (AMC)					1	0.46	0.64
	On Campus	215	1.84	1.15			
	Off Campus	100	1.78	1.13			

[+] n may not equal 320 due to missing data

Table 11

Results of T-tests on Differences in Type of Information by Race (N = 320)[+]

Scale	Race of Participants	n	m	s.d.	df	F	p
Personal Development and Interpersonal Relationships (PDIR)					1	0.75	0.45
	Majority	254	1.20	0.98			
	Minority	51	1.32	1.01			
Exploring Institutional Policies (EIP)					1	1.23	0.22
	Majority	254	1.21	0.98			
	Minority	51	1.39	0.98			
Registration and Class Scheduling (RCS)					1	1.24	0.27
	Majority	254	2.44	1.35			
	Minority	51	2.19	1.13			
Teaching Personal Skills (TPS)					1	1.15	0.25
	Majority	254	1.42	1.17			
	Minority	51	1.62	1.00			
Academic Major and Courses (AMC)					1	0.36	0.72
	Majority	254	1.84	1.13			
	Minority	51	1.90	1.18			

[+] n may not equal 320 due to missing data

Table 12

Results of ANOVA on Differences in Type of Information by Academic College (N = 320)[+]

Scale	College of Participants	n	m	s.d.	df	F	p
Personal Development and Interpersonal Relationships (PDIR)					7	1.15	0.33
	Agriculture & Life Sciences	11	0.93	0.85			
	Architecture & Urban Studies	9	1.17	0.89			
	Business	104	1.08	1.03			
	Engineering	75	1.32	0.92			
	Liberal Arts & Human Sciences	17	1.13	0.83			
	Natural Resources	31	1.25	0.92			
	Science	17	1.69	1.15			
	University Studies	51	1.19	1.02			
Exploring Institutional Policies (EIP)					7	1.90	0.07
	Agriculture & Life Sciences	11	0.75	0.73			
	Architecture & Urban Studies	9	1.04	0.79			
	Business	104	1.11	0.94			
	Engineering	75	1.24	0.97			
	Liberal Arts & Human Sciences	17	1.55	1.02			
	Natural Resources	31	1.08	0.80			
	Science	17	1.52	1.09			
	University Studies	51	1.51	1.07			

[+] n may not equal 320 due to missing data

Table 12 (cont.)

Results of ANOVA on Differences in Type of Information by Academic College (N = 320)[+]

Scale	College of Participants	n	m	s.d.	df	F	p
Registration and Class Scheduling (RCS)					7	1.40	0.20
	Agriculture & Life Sciences	11	1.77	1.51			
	Architecture & Urban Studies	9	1.73	1.34			
	Business	104	2.31	1.39			
	Engineering	75	2.57	1.25			
	Liberal Arts & Human Sciences	17	2.91	1.23			
	Natural Resources	31	2.40	1.01			
	Science	17	2.37	1.52			
	University Studies	51	2.25	1.31			
Teaching Personal Skills (TPS)					7	4.44	0.00*
	Agriculture & Life Sciences	11	0.67	0.68			
	Architecture & Urban Studies	9	1.22	1.03			
	Business	104	1.26	1.09			
	Engineering	75	1.37	1.12			
	Liberal Arts & Human Sciences	17	1.83	1.65			
	Natural Resources	31	1.37	1.07			
	Science	17	1.71	0.95			
	University Studies	51	2.15	1.27			

[+] n may not equal 320 due to missing data

* significant at the $p < 0.05$ level

Table 12 (cont.)

Results of ANOVA on Differences in Type of Information by Academic College (N = 320)

Scale	College of Participants	n	m	s.d.	df	F	p
Academic Major and Courses (AMC)					7	1.47	0.18
	Agriculture & Life Sciences	11	1.30	1.32			
	Architecture & Urban Studies	9	1.35	0.84			
	Business	104	1.67	1.13			
	Engineering	75	1.85	1.14			
	Liberal Arts & Human Sciences	17	2.06	1.37			
	Natural Resources	31	1.84	1.04			
	Science	17	2.22	1.33			
	University Studies	51	2.03	1.07			

* n may not equal 320 due to missing data

Table 13

Results of Tukey HSD on Differences in Type of Information by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Personal Development and Interpersonal Relationships (PDIR)				
	Agriculture & Life Sciences	Architecture & Urban Studies	0.24	1.00
		Business	0.15	1.00
		Engineering	0.40	0.92
		Liberal Arts & Human Sciences	0.20	1.00
		Natural Resources	0.33	0.98
		Science	0.76	0.48
		University Studies	0.26	0.99
	Architecture & Urban Studies	Agriculture & Life Sciences	0.24	1.00
		Business	0.09	1.00
		Engineering	0.16	1.00
		Liberal Arts & Human Sciences	0.04	1.00
		Natural Resources	0.09	1.00
		Science	0.52	0.90
		University Studies	0.02	1.00
	Business	Agriculture & Life Sciences	0.15	1.00
		Architecture & Urban Studies	0.09	1.00
		Engineering	0.24	0.72
		Liberal Arts & Human Sciences	0.05	1.00
		Natural Resources	0.17	0.97
		Science	0.61	0.26
		University Studies	0.11	1.00
	Engineering	Agriculture & Life Sciences	0.40	0.92
		Architecture & Urban Studies	0.16	1.00
		Business	0.24	0.72
		Liberal Arts & Human Sciences	0.19	1.00
		Natural Resources	0.07	1.00
		Science	0.36	0.87
		University Studies	0.14	0.99

Table 13 (cont.)

Results of Tukey HSD on Differences in Type of Information by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Personal Development and Interpersonal Relationships (PDIR)				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	0.20	1.00
		Architecture & Urban Studies	0.04	1.00
		Business	0.05	1.00
		Engineering	0.19	1.00
		Natural Resources	0.12	1.00
		Science	0.56	0.71
		University Studies	0.06	1.00
	Natural Resources	Agriculture & Life Sciences	0.33	0.98
		Architecture & Urban Studies	0.09	1.00
		Business	0.17	0.99
		Engineering	0.07	1.00
		Liberal Arts & Human Sciences	0.12	1.00
		Science	0.43	0.82
		University Studies	0.07	1.00
	Science	Agriculture & Life Sciences	0.76	0.48
		Architecture & Urban Studies	0.52	0.90
		Business	0.61	0.26
		Engineering	0.36	0.87
		Liberal Arts & Human Sciences	0.56	0.71
		Natural Resources	0.43	0.82
		University Studies	0.50	0.60
	University Studies	Agriculture & Life Sciences	0.26	0.99
		Architecture & Urban Studies	0.02	1.00
		Business	0.11	1.00
		Engineering	0.14	0.99
		Liberal Arts & Human Sciences	0.06	1.00
		Natural Resources	0.07	1.00
		Science	0.50	0.60

Table 13 (cont.)

Results of Tukey HSD on Differences in Type of Information by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Exploring Institutional Policies (EIP)				
	Agriculture & Life Sciences	Architecture & Urban Studies	0.30	1.00
		Business	0.36	0.93
		Engineering	0.49	0.77
		Liberal Arts & Human Sciences	0.81	0.38
		Natural Resources	0.33	0.98
		Science	0.77	0.44
		University Studies	0.77	0.25
	Architecture & Urban Studies	Agriculture & Life Sciences	0.30	1.00
		Business	0.06	1.00
		Engineering	0.19	1.00
		Liberal Arts & Human Sciences	0.51	0.91
		Natural Resources	0.03	1.00
		Science	0.47	0.93
		University Studies	0.47	0.88
	Business	Agriculture & Life Sciences	0.36	0.93
		Architecture & Urban Studies	0.06	1.00
		Engineering	0.13	0.99
		Liberal Arts & Human Sciences	0.44	0.65
		Natural Resources	0.03	1.00
		Science	0.41	0.74
		University Studies	0.40	0.23
	Engineering	Agriculture & Life Sciences	0.49	0.77
		Architecture & Urban Studies	0.19	1.00
		Business	0.13	0.99
		Liberal Arts & Human Sciences	0.32	0.92
		Natural Resources	0.16	1.00
		Science	0.28	0.96
		University Studies	0.28	0.76

Table 13 (cont.)

Results of Tukey HSD on Differences in Type of Information by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Exploring Institutional Policies (EIP)				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	0.81	0.38
		Architecture & Urban Studies	0.51	0.91
		Business	0.44	0.65
		Engineering	0.32	0.92
		Natural Resources	0.48	0.73
		Science	0.04	1.00
		University Studies	0.04	1.00
	Natural Resources	Agriculture & Life Sciences	0.33	0.98
		Architecture & Urban Studies	0.03	1.00
		Business	0.03	1.00
		Engineering	0.16	1.00
		Liberal Arts & Human Sciences	0.48	0.73
		Science	0.44	0.80
		University Studies	0.43	0.50
	Science	Agriculture & Life Sciences	0.77	0.44
		Architecture & Urban Studies	0.47	0.93
		Business	0.41	0.74
		Engineering	0.28	0.96
		Liberal Arts & Human Sciences	0.04	1.00
		Natural Resources	0.44	0.80
		University Studies	0.01	1.00
	University Studies	Agriculture & Life Sciences	0.77	0.25
		Architecture & Urban Studies	0.47	0.88
		Business	0.40	0.23
		Engineering	0.28	0.76
		Liberal Arts & Human Sciences	0.04	1.00
		Natural Resources	0.43	0.50
		Science	0.01	1.00

Table 13 (cont.)

Results of Tukey HSD on Differences in Type of Information by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Registration and Class Scheduling (RCS)				
	Agriculture & Life Sciences	Architecture & Urban Studies	0.04	1.00
		Business	0.54	0.90
		Engineering	0.81	0.56
		Liberal Arts & Human Sciences	1.14	0.33
		Natural Resources	0.63	0.87
		Science	0.59	0.94
		University Studies	0.47	0.96
	Architecture & Urban Studies	Agriculture & Life Sciences	0.04	1.00
		Business	0.58	0.91
		Engineering	0.84	0.61
		Liberal Arts & Human Sciences	1.18	0.37
		Natural Resources	0.67	0.88
		Science	0.64	0.94
		University Studies	0.51	0.96
	Business	Agriculture & Life Sciences	0.54	0.90
		Architecture & Urban Studies	0.58	0.91
		Engineering	0.26	0.89
		Liberal Arts & Human Sciences	0.60	0.65
		Natural Resources	0.09	1.00
		Science	0.06	1.00
		University Studies	0.06	1.00
	Engineering	Agriculture & Life Sciences	0.80	0.56
		Architecture & Urban Studies	0.84	0.61
		Business	0.26	0.89
		Liberal Arts & Human Sciences	0.34	0.98
		Natural Resources	0.17	1.00
		Science	0.21	1.00
		University Studies	0.33	0.87

Table 13 (cont.)

Results of Tukey HSD on Differences in Type of Information by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Registration and Class Scheduling (RCS)				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	1.14	0.33
		Architecture & Urban Studies	1.18	0.37
		Business	0.60	0.65
		Engineering	0.34	0.98
		Natural Resources	0.51	0.90
		Science	0.54	0.93
		University Studies	0.67	0.61
	Natural Resources	Agriculture & Life Sciences	0.63	0.87
		Architecture & Urban Studies	0.67	0.88
		Business	0.09	1.00
		Engineering	0.17	1.00
		Liberal Arts & Human Sciences	0.51	0.90
		Science	0.04	1.00
		University Studies	0.16	1.00
	Science	Agriculture & Life Sciences	0.59	0.94
		Architecture & Urban Studies	0.64	0.94
		Business	0.06	1.00
		Engineering	0.21	1.00
		Liberal Arts & Human Sciences	0.54	0.93
		Natural Resources	0.04	1.00
		University Studies	0.12	1.00
	University Studies	Agriculture & Life Sciences	0.47	0.96
		Architecture & Urban Studies	0.51	0.96
		Business	0.06	1.00
		Engineering	0.33	0.97
		Liberal Arts & Human Sciences	0.67	0.61
		Natural Resources	0.16	1.00
		Science	0.12	1.00

Table 13 (cont.)

Results of Tukey HSD on Differences in Type of Information by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Teaching Personal Skills (TPS)				
	Agriculture & Life Sciences	Architecture & Urban Studies	0.56	0.96
		Business	0.59	0.73
		Engineering	0.70	0.55
		Liberal Arts & Human Sciences	1.17	0.15
		Natural Resources	0.70	0.65
		Science	1.04	0.27
		University Studies	1.49	0.00*
	Architecture & Urban Studies	Agriculture & Life Sciences	0.56	0.96
		Business	0.03	1.00
		Engineering	0.14	1.00
		Liberal Arts & Human Sciences	0.61	0.90
		Natural Resources	0.15	1.00
		Science	0.48	0.97
		University Studies	0.93	0.32
	Business	Agriculture & Life Sciences	0.59	0.73
		Architecture & Urban Studies	0.03	1.00
		Engineering	0.11	1.00
		Liberal Arts & Human Sciences	0.58	0.53
		Natural Resources	0.11	1.00
		Science	0.45	0.80
		University Studies	0.90	0.00*
	Engineering	Agriculture & Life Sciences	0.70	0.55
		Architecture & Urban Studies	0.14	1.00
		Business	0.11	1.00
		Liberal Arts & Human Sciences	0.47	0.80
		Natural Resources	0.00	1.00
		Science	0.34	0.96
		University Studies	0.79	0.00*

* significant at the p < 0.05 level

Table 13 (cont.)

Results of Tukey HSD on Differences in Type of Information by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Teaching Personal Skills (TPS)				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	1.17	0.15
		Architecture & Urban Studies	0.61	0.90
		Business	0.58	0.53
		Engineering	0.47	0.80
		Natural Resources	0.46	0.88
		Science	0.13	1.00
		University Studies	0.32	0.97
	Natural Resources	Agriculture & Life Sciences	0.70	0.65
		Architecture & Urban Studies	0.15	1.00
		Business	0.11	1.00
		Engineering	0.00	1.00
		Liberal Arts & Human Sciences	0.46	0.88
		Science	0.33	0.98
		University Studies	0.78	0.06
	Science	Agriculture & Life Sciences	1.04	0.27
		Architecture & Urban Studies	0.48	0.97
		Business	0.45	0.80
		Engineering	0.34	0.96
		Liberal Arts & Human Sciences	0.13	1.00
		Natural Resources	0.33	0.98
		University Studies	0.45	0.86
	University Studies	Agriculture & Life Sciences	1.49	0.00*
		Architecture & Urban Studies	0.93	0.32
		Business	0.90	0.00*
		Engineering	0.79	0.00*
		Liberal Arts & Human Sciences	0.32	0.97
		Natural Resources	0.78	0.06
		Science	0.45	0.86

* significant at the $p < 0.05$ level

Table 13 (cont.)

Results of Tukey HSD on Differences in Type of Information by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Academic Major and Courses (AMC)				
	Agriculture & Life Sciences	Architecture & Urban Studies	0.05	1.00
		Business	0.36	0.97
		Engineering	0.55	0.81
		Liberal Arts & Human Sciences	0.76	0.68
		Natural Resources	0.54	0.88
		Science	0.92	0.43
		University Studies	0.73	0.54
	Architecture & Urban Studies	Agriculture & Life Sciences	0.05	1.00
		Business	0.32	0.99
		Engineering	0.50	0.92
		Liberal Arts & Human Sciences	0.71	0.80
		Natural Resources	0.50	0.95
		Science	0.87	0.59
		University Studies	0.68	0.72
	Business	Agriculture & Life Sciences	0.36	0.97
		Architecture & Urban Studies	0.32	0.99
		Engineering	0.19	0.96
		Liberal Arts & Human Sciences	0.39	0.89
		Natural Resources	0.18	0.96
		Science	0.55	0.58
		University Studies	0.36	0.58
	Engineering	Agriculture & Life Sciences	0.55	0.81
		Architecture & Urban Studies	0.50	0.92
		Business	0.19	0.96
		Liberal Arts & Human Sciences	0.20	1.00
		Natural Resources	0.01	1.00
		Science	0.37	0.93
		University Studies	0.18	0.99

Table 13 (cont.)

Results of Tukey HSD on Differences in Type of Information by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Academic Major and Courses (AMC)				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	0.76	0.68
		Architecture & Urban Studies	0.71	0.80
		Business	0.39	0.89
		Engineering	0.20	1.00
		Natural Resources	0.21	1.00
		Science	0.16	1.00
		University Studies	0.03	1.00
	Natural Resources	Agriculture & Life Sciences	0.54	0.88
		Architecture & Urban Studies	0.49	0.95
		Business	0.18	1.00
		Engineering	0.01	1.00
		Liberal Arts & Human Sciences	0.21	1.00
		Science	0.38	0.96
		University Studies	0.19	1.00
	Science	Agriculture & Life Sciences	0.92	0.43
		Architecture & Urban Studies	0.87	0.59
		Business	0.55	0.58
		Engineering	0.37	0.93
		Liberal Arts & Human Sciences	0.16	1.00
		Natural Resources	0.38	0.96
		University Studies	0.19	1.00
	University Studies	Agriculture & Life Sciences	0.73	0.54
		Architecture & Urban Studies	0.68	0.72
		Business	0.36	0.58
		Engineering	0.18	0.99
		Liberal Arts & Human Sciences	0.03	1.00
		Natural Resources	0.19	1.00
		Science	0.19	1.00

College of Agriculture and Life Sciences (m = 0.67). Even though the ANOVA returned a significance of 0.07 for the Exploring Institutional Policies (EIP) scale, the Tukey HSD post hoc clarified that the difference in means between the eight academic colleges was not a significant difference.

Overall Satisfaction

The fourth research question sought to identify the level of satisfaction expressed by participants when receiving academic advice online. To address this question, the researcher calculated descriptive statistics for each of the five items represented in Part III of the Online Academic Advising Inventory. The results are summarized in Table 14. Students were asked to respond to each item on a scale of 1 (strongly disagree) to 4 (strongly agree). The data indicated that participants agreed with all four items and were satisfied with all aspects of their online academic advising experience. The item receiving the highest level of satisfaction was the item related to sufficient notice of deadlines about institutional policies and procedures (m = 3.00).

Differences by Gender

The twelfth research question posed in the study examined whether there were differences by gender in the level of satisfaction expressed by participants on their online academic advising experience. A t-test was run on each of the five items, comparing the mean scores of male participants to the mean scores of female participants. Results of the t-test are reported in Table 15. No significant differences were found between the level of satisfaction expressed by male participants and female participants. It should be noted that a significance of 0.11 was found the statement referring to the availability of academic advice online. Male participants (m = 3.00) reported a greater level of satisfaction than female participants (m = 2.89) for that particular statement. Although the finding is not statistically significant, the probability

Table 14

Overall Satisfaction with Online Academic Advising (N = 320)

Item[+]	m	s.d.
I am satisfied in general with the online academic advising I have received.	2.67	0.73
I have received accurate information about courses, programs, and requirements through online academic advising.	2.81	0.87
Sufficient prior notice has been provided about deadlines related to institutional policies and procedures.	3.00	0.63
Online advising has been available when I needed it.	2.86	0.73
Sufficient time has been available during online advising sessions.	2.76	0.54

[+] Response = (strongly disagree = 1; strongly agree = 4)

Table 15

Results of T-tests on Differences in Satisfaction by Gender (N = 320)[+]

Item	Gender of Participants	n	m	s.d.	df	F	p
General Satisfaction					1	0.78	0.43
	Male	141	2.84	0.69			
	Female	168	2.78	0.64			
Accurate Information					1	1.35	0.18
	Male	141	3.00	0.65			
	Female	168	2.89	0.73			
Sufficient Notice of Deadlines					1	0.04	0.96
	Male	141	3.01	0.72			
	Female	168	3.02	0.74			
Availability					1	1.58	0.11
	Male	140	2.94	0.67			
	Female	168	2.85	0.72			
Sufficient Amount of Time					1	0.47	0.64
	Male	139	2.81	0.62			
	Female	168	2.78	0.62			

[+] n may not equal 320 due to missing data

merits further research to gain more perspective on how males gauge availability of information in comparison to females.

Differences by Residency

The thirteenth research question posed in the study examined whether there were differences by type of residence (on campus or not on campus) in the level of satisfaction experienced when receiving online academic advising. A t-test was run on each of the five items, comparing the mean scores of on-campus participants to the mean scores of participants who did not live on campus. Results of the t-test are reported in Table 16. No significant differences were found between the type of information sought by on campus participants and participants not living on campus.

Differences by Race

The next to last research question posed in the study examined whether there were differences by race in the level of satisfaction expressed by participants when receiving online academic advising. A t-test was run on each of the five items, comparing the mean scores of majority participants to the mean scores of minority participants. Results of the t-test are reported in Table 17. A significant difference ($p < .05$) was found on the statements referring to sufficient notice about institutional deadlines and the amount of time dedicated during online advising sessions. Also, it should be noted that a significance of 0.07 was found on the statement referring to the accuracy of information provided during online academic advising. Even though this finding is not statistically significant, it does merit further research to determine why majority students were more satisfied with the information they were provided than minority students.

Table 16

Results of T-tests on Differences in Satisfaction by Residence Type (N = 320)*

Item	Residence of Participants	n	m	s.d.	df	F	p
General Satisfaction					1	0.99	0.32
	On Campus	213	2.83	0.64			
	Off Campus	100	2.75	0.74			
Accurate Information					1	0.97	0.33
	On Campus	213	2.96	0.69			
	Off Campus	100	2.88	0.71			
Sufficient Notice of Deadlines					1	1.6	0.11
	On Campus	214	3.06	0.67			
	Off Campus	100	2.92	0.82			
Availability					1	0.77	0.44
	On Campus	213	2.85	0.67			
	Off Campus	100	2.91	0.77			
Sufficient Amount of Time					1	0.35	0.72
	On Campus	212	2.81	0.62			
	Off Campus	100	2.78	0.63			

* n may not equal 320 due to missing data

Table 17

Results of T-tests on Differences in Satisfaction by Race (N = 320)[+]

Item	Race of Participants	n	m	s.d.	df	F	p
General Satisfaction					1	1.51	0.13
	Majority	252	2.84	0.66			
	Minority	51	2.67	0.71			
Accurate Information					1	1.78	0.07
	Majority	252	2.98	0.7			
	Minority	51	2.78	0.73			
Sufficient Notice of Deadlines					1	2.03	0.04*
	Majority	253	3.05	0.72			
	Minority	51	2.82	0.77			
Availability					1	1.57	0.12
	Majority	252	2.91	0.66			
	Minority	51	2.75	0.84			
Sufficient Amount of Time					1	2.61	0.01*
	Majority	252	2.85	0.61			
	Minority	50	2.60	0.67			

[+] n may not equal 304 due to missing data

* significant at the $p < 0.05$ level

Differences by Academic College

The final research question posed in the study examined whether there were differences by academic college in the level of satisfaction experienced by participants receiving academic advice online. Two statistical tests were used to analyze the data. First, an ANOVA was run on each of the four scales, comparing the mean scores of participants from eight different academic colleges to one another. Second, the Tukey HSD post hoc test was used to determine which colleges significantly differed from one another. A summary of the ANOVA results is presented in Table 18. A summary of the Tukey HSD results is presented in Table 19. A significant difference ($p < .05$) was found on three of the five items: (a) Accurate Information, (b) Sufficient Notice of Deadlines, and (c) Availability. Participants from the College of Engineering (m = 3.12) reported a higher level of satisfaction with the accuracy of the information they receive than participants from the College of Business (m = 2.77). In regards to sufficient notice of deadlines, participants from the College of Engineering (m = 3.19) and University Studies (m = 3.25) both reported significantly higher levels of satisfaction with the deadline notices they receive than participants from the College of Business (m = 2.76). Finally, respondents from the College of Engineering also reported a higher level of satisfaction with the availability of online advising. Participants from the College of Engineering (m = 3.07) reported a significantly higher level of satisfaction than participants from the College of Architecture and Urban Studies (m = 2.33) and the College of Business (m = 2.69). These differences in satisfaction will play an important role in determining which methods are most effective when providing academic advice to students online.

Table 18

Results of ANOVA on Differences in Satisfaction by Academic College (N = 320)

Item	College of Participants	n	m	s.d.	df	F	p
General Satisfaction					7	1.90	0.07
	Agriculture & Life Sciences	11	2.64	0.81			
	Architecture & Urban Studies	9	2.78	0.83			
	Businees	104	2.64	0.69			
	Engineering	75	2.93	0.55			
	Liberal Arts & Human Sciences	17	2.76	0.44			
	Natural Resources	30	2.93	0.64			
	Science	16	3.06	0.57			
	University Studies	51	2.84	0.78			
Accurate Information					7	2.66	0.01*
	Agriculture & Life Sciences	11	2.82	0.75			
	Architecture & Urban Studies	8	2.50	1.07			
	Businees	104	2.77	0.70			
	Engineering	75	3.12	0.61			
	Liberal Arts & Human Sciences	17	2.82	0.88			
	Natural Resources	30	3.10	0.55			
	Science	17	3.12	0.49			
	University Studies	51	2.98	0.73			
Sufficient Notice of Deadlines					7	4.24	0.00*
	Agriculture & Life Sciences	11	3.00	0.63			
	Architecture & Urban Studies	9	2.67	1.00			
	Businees	104	2.76	0.69			
	Engineering	75	3.19	0.75			
	Liberal Arts & Human Sciences	17	2.88	0.78			
	Natural Resources	30	3.13	0.57			
	Science	17	3.24	0.44			
	University Studies	51	3.25	0.72			

* n may not equal 320 due to missing data

* significant at the p < 0.05 level

Table 18 (cont.)

Results of ANOVA on differences in Satisfaction by Academic College (N = 320)

Item	College of Participants	n	m	s.d.	df	F	p
Availability					7	3.89	0.00*
	Agriculture & Life Sciences	11	2.82	0.60			
	Architecture & Urban Studies	9	2.33	0.71			
	Businees	104	2.69	0.73			
	Engineering	74	3.07	0.63			
	Liberal Arts & Human Sciences	17	2.59	0.87			
	Natural Resources	30	3.07	0.58			
	Science	17	3.12	0.49			
	University Studies	51	2.92	0.69			
Sufficient Amount of Time					7	2.18	0.04*
	Agriculture & Life Sciences	11	2.82	0.87			
	Architecture & Urban Studies	9	2.33	0.71			
	Businees	104	2.72	0.66			
	Engineering	74	2.86	0.56			
	Liberal Arts & Human Sciences	17	2.53	0.51			
	Natural Resources	30	2.97	0.32			
	Science	16	2.81	0.75			
	University Studies	51	2.92	0.63			

* n may not equal 320 due to missing data

* significant at the p < 0.05 level

Table 19

Results of Tukey HSD on Differences in Satisfaction by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
General Satisfaction				
	Agriculture & Life Sciences	Architecture & Urban Studies	0.14	1.00
		Business	0.01	1.00
		Engineering	0.30	0.87
		Liberal Arts & Human Sciences	0.13	1.00
		Natural Resources	0.30	0.91
		Science	0.43	0.73
		University Studies	0.21	0.98
	Architecture & Urban Studies	Agriculture & Life Sciences	0.14	1.00
		Business	0.13	1.00
		Engineering	0.16	1.00
		Liberal Arts & Human Sciences	0.01	1.00
		Natural Resources	0.16	1.00
		Science	0.28	0.97
		University Studies	0.07	1.00
	Business	Agriculture & Life Sciences	0.01	1.00
		Architecture & Urban Studies	0.13	1.00
		Engineering	0.29	0.08
		Liberal Arts & Human Sciences	0.12	1.00
		Natural Resources	0.29	0.42
		Science	0.42	0.28
		University Studies	0.20	0.66
	Engineering	Agriculture & Life Sciences	0.30	0.87
		Architecture & Urban Studies	0.16	1.00
		Business	0.29	0.08
		Liberal Arts & Human Sciences	0.17	0.98
		Natural Resources	0.00	1.00
		Science	0.13	1.00
		University Studies	0.09	1.00

Table 19 (cont.)

Results of Tukey HSD on Differences in Satisfaction by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
General Satisfaction				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	0.13	1.00
		Architecture & Urban Studies	0.01	1.00
		Business	0.12	1.00
		Engineering	0.17	0.98
		Natural Resources	0.17	1.00
		Science	0.30	0.90
		University Studies	0.08	1.00
	Natural Resources	Agriculture & Life Sciences	0.30	0.91
		Architecture & Urban Studies	0.16	1.00
		Business	0.29	0.42
		Engineering	0.00	1.00
		Liberal Arts & Human Sciences	0.17	0.99
		Science	0.13	1.00
		University Studies	0.09	1.00
	Science	Agriculture & Life Sciences	0.43	0.73
		Architecture & Urban Studies	0.28	0.97
		Business	0.42	0.28
		Engineering	0.13	1.00
		Liberal Arts & Human Sciences	0.30	0.90
		Natural Resources	0.13	1.00
		University Studies	0.22	0.95
	University Studies	Agriculture & Life Sciences	0.21	0.98
		Architecture & Urban Studies	0.07	1.00
		Business	0.20	0.66
		Engineering	0.09	1.00
		Liberal Arts & Human Sciences	0.08	1.00
		Natural Resources	0.09	1.00
		Science	0.22	0.95

Table 19 (cont.)

Results of Tukey HSD on Differences in Satisfaction by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Accurate Information				
	Agriculture & Life Sciences	Architecture & Urban Studies	0.32	0.98
		Business	0.05	1.00
		Engineering	0.30	0.87
		Liberal Arts & Human Sciences	0.01	1.00
		Natural Resources	0.28	0.94
		Science	0.30	0.95
		University Studies	0.16	1.00
	Architecture & Urban Studies	Agriculture & Life Sciences	0.32	0.98
		Business	0.27	0.96
		Engineering	0.62	0.23
		Liberal Arts & Human Sciences	0.32	0.96
		Natural Resources	0.60	0.36
		Science	0.62	0.42
		University Studies	0.48	0.59
	Business	Agriculture & Life Sciences	0.05	1.00
		Architecture & Urban Studies	0.27	0.96
		Engineering	0.35	0.02*
		Liberal Arts & Human Sciences	0.05	1.00
		Natural Resources	0.33	0.28
		Science	0.35	0.53
		University Studies	0.21	0.62
	Engineering	Agriculture & Life Sciences	0.30	0.87
		Architecture & Urban Studies	0.62	0.23
		Business	0.35	0.02*
		Liberal Arts & Human Sciences	0.30	0.75
		Natural Resources	0.02	1.00
		Science	0.00	1.00
		University Studies	0.14	0.95

* significant at the $p < 0.05$ level

Table 19 (cont.)

Results of Tukey HSD on Differences in Satisfaction by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Accurate Information				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	0.01	1.00
		Architecture & Urban Studies	0.32	0.96
		Business	0.05	1.00
		Engineering	0.30	0.75
		Natural Resources	0.28	0.89
		Science	0.29	0.92
		University Studies	0.16	0.99
	Natural Resources	Agriculture & Life Sciences	0.28	0.94
		Architecture & Urban Studies	0.60	0.36
		Business	0.33	0.28
		Engineering	0.02	1.00
		Liberal Arts & Human Sciences	0.28	0.89
		Science	0.02	1.00
		University Studies	0.12	1.00
	Science	Agriculture & Life Sciences	0.30	0.95
		Architecture & Urban Studies	0.62	0.42
		Business	0.35	0.53
		Engineering	0.00	1.00
		Liberal Arts & Human Sciences	0.29	0.92
		Natural Resources	0.02	1.00
		University Studies	0.14	1.00
	University Studies	Agriculture & Life Sciences	0.16	1.00
		Architecture & Urban Studies	0.48	0.59
		Business	0.21	0.62
		Engineering	0.14	0.95
		Liberal Arts & Human Sciences	0.16	0.99
		Natural Resources	0.12	1.00
		Science	0.14	1.00

Table 19 (cont.)

Results of Tukey HSD on Differences in Satisfaction by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Sufficient Notice of Deadlines				
	Agriculture & Life Sciences	Architecture & Urban Studies	0.33	0.97
		Business	0.24	0.96
		Engineering	0.19	0.99
		Liberal Arts & Human Sciences	0.12	1.00
		Natural Resources	0.13	1.00
		Science	0.24	0.99
		University Studies	0.25	0.96
	Architecture & Urban Studies	Agriculture & Life Sciences	0.33	0.97
		Business	0.09	1.00
		Engineering	0.52	0.42
		Liberal Arts & Human Sciences	0.22	1.00
		Natural Resources	0.47	0.65
		Science	0.57	0.51
		University Studies	0.59	0.29
	Business	Agriculture & Life Sciences	0.24	0.96
		Architecture & Urban Studies	0.09	1.00
		Engineering	0.43	0.00*
		Liberal Arts & Human Sciences	0.12	1.00
		Natural Resources	0.37	0.17
		Science	0.48	0.16
		University Studies	0.50	0.00*
	Engineering	Agriculture & Life Sciences	0.19	0.99
		Architecture & Urban Studies	0.52	0.42
		Business	0.43	0.00*
		Liberal Arts & Human Sciences	0.30	0.74
		Natural Resources	0.05	1.00
		Science	0.05	1.00
		University Studies	0.07	1.00

* significant at the p < 0.05 level

Table 19 (cont.)

Results of Tukey HSD on Differences in Satisfaction by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Sufficient Notice of Deadlines				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	0.12	1.00
		Architecture & Urban Studies	0.22	1.00
		Business	0.12	1.00
		Engineering	0.30	0.74
		Natural Resources	0.25	0.94
		Science	0.35	0.82
		University Studies	0.37	0.55
	Natural Resources	Agriculture & Life Sciences	0.13	1.00
		Architecture & Urban Studies	0.47	0.65
		Business	0.37	0.17
		Engineering	0.05	1.00
		Liberal Arts & Human Sciences	0.25	0.94
		Science	0.10	1.00
		University Studies	0.12	1.00
	Science	Agriculture & Life Sciences	0.24	0.99
		Architecture & Urban Studies	0.57	0.51
		Business	0.48	0.16
		Engineering	0.05	1.00
		Liberal Arts & Human Sciences	0.35	0.82
		Natural Resources	0.10	1.00
		University Studies	0.02	1.00
	University Studies	Agriculture & Life Sciences	0.25	0.96
		Architecture & Urban Studies	0.59	0.29
		Business	0.50	0.00*
		Engineering	0.07	1.00
		Liberal Arts & Human Sciences	0.37	0.55
		Natural Resources	0.12	1.00
		Science	0.02	1.00

* significant at the $p < 0.05$ level

Table 19 (cont.)

Results of Tukey HSD on Differences in Satisfaction by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Availability				
	Agriculture & Life Sciences	Architecture & Urban Studies	0.48	0.75
		Business	0.13	1.00
		Engineering	0.25	0.95
		Liberal Arts & Human Sciences	0.23	0.99
		Natural Resources	0.25	0.97
		Science	0.30	0.95
		University Studies	0.10	1.00
	Architecture & Urban Studies	Agriculture & Life Sciences	0.48	0.75
		Business	0.36	0.79
		Engineering	0.73	0.05*
		Liberal Arts & Human Sciences	0.25	0.99
		Natural Resources	0.73	0.09
		Science	0.78	0.10
		University Studies	0.59	0.24
	Business	Agriculture & Life Sciences	0.13	1.00
		Architecture & Urban Studies	0.36	0.80
		Engineering	0.38	0.01*
		Liberal Arts & Human Sciences	0.10	1.00
		Natural Resources	0.37	0.14
		Science	0.43	0.25
		University Studies	0.23	0.50
	Engineering	Agriculture & Life Sciences	0.25	0.95
		Architecture & Urban Studies	0.73	0.05*
		Business	0.38	0.01*
		Liberal Arts & Human Sciences	0.48	0.15
		Natural Resources	0.00	1.00
		Science	0.05	1.00
		University Studies	0.15	0.94

* significant at the p < 0.05 level

Table 19 (cont.)

Results of Tukey HSD on Differences in Satisfaction by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Availability				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	0.23	0.99
		Architecture & Urban Studies	0.25	0.99
		Business	0.10	1.00
		Engineering	0.48	0.15
		Natural Resources	0.48	0.28
		Science	0.53	0.31
		University Studies	0.33	0.65
	Natural Resources	Agriculture & Life Sciences	0.25	0.97
		Architecture & Urban Studies	0.73	0.09
		Business	0.37	0.14
		Engineering	0.00	1.00
		Liberal Arts & Human Sciences	0.48	0.28
		Science	0.05	1.00
		University Studies	0.15	0.98
	Science	Agriculture & Life Sciences	0.30	0.95
		Architecture & Urban Studies	0.78	0.10
		Business	0.43	0.25
		Engineering	0.05	1.00
		Liberal Arts & Human Sciences	0.53	0.31
		Natural Resources	0.05	1.00
		University Studies	0.20	0.97
	University Studies	Agriculture & Life Sciences	0.10	1.00
		Architecture & Urban Studies	0.59	0.24
		Business	0.23	0.50
		Engineering	0.15	0.94
		Liberal Arts & Human Sciences	0.33	0.65
		Natural Resources	0.15	0.98
		Science	0.20	0.97

Table 19 (cont.)

Results of Tukey HSD on Differences in Satisfaction by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Sufficient Amount of Time				
	Agriculture & Life Sciences	Architecture & Urban Studies	0.48	0.65
		Business	0.10	1.00
		Engineering	0.05	1.00
		Liberal Arts & Human Sciences	0.29	0.93
		Natural Resources	0.15	1.00
		Science	0.01	1.00
		University Studies	0.10	1.00
	Architecture & Urban Studies	Agriculture & Life Sciences	0.48	0.65
		Business	0.69	0.61
		Engineering	0.53	0.22
		Liberal Arts & Human Sciences	0.20	0.99
		Natural Resources	0.63	0.12
		Science	0.48	0.57
		University Studies	0.59	0.14
	Business	Agriculture & Life Sciences	0.10	1.00
		Architecture & Urban Studies	0.39	0.61
		Engineering	0.14	0.79
		Liberal Arts & Human Sciences	0.19	0.93
		Natural Resources	0.25	0.53
		Science	0.09	1.00
		University Studies	0.20	0.55
	Engineering	Agriculture & Life Sciences	0.05	1.00
		Architecture & Urban Studies	0.53	0.22
		Business	0.14	0.79
		Liberal Arts & Human Sciences	0.34	0.46
		Natural Resources	0.10	1.00
		Science	0.05	1.00
		University Studies	0.06	1.00

Table 19 (cont.)

Results of Tukey HSD on Differences in Satisfaction by Academic College (N = 320)

Scale	College of Participants	College of Comparison	Mean Difference	p
Sufficient Amount of Time				
	Liberal Arts & Human Sciences	Agriculture & Life Sciences	0.29	0.93
		Architecture & Urban Studies	0.20	0.99
		Business	0.19	0.93
		Engineering	0.34	0.46
		Natural Resources	0.44	0.27
		Science	0.28	0.89
		University Studies	0.39	0.31
	Natural Resources	Agriculture & Life Sciences	0.15	1.00
		Architecture & Urban Studies	0.63	0.12
		Business	0.25	0.53
		Engineering	0.10	1.00
		Liberal Arts & Human Sciences	0.44	0.27
		Science	0.15	0.99
		University Studies	0.05	1.00
	Science	Agriculture & Life Sciences	0.01	1.00
		Architecture & Urban Studies	0.48	0.57
		Business	0.09	1.00
		Engineering	0.05	1.00
		Liberal Arts & Human Sciences	0.28	0.89
		Natural Resources	0.15	0.99
		University Studies	0.11	1.00
	University Studies	Agriculture & Life Sciences	0.10	1.00
		Architecture & Urban Studies	0.59	0.14
		Business	0.20	0.55
		Engineering	0.06	1.00
		Liberal Arts & Human Sciences	0.39	0.31
		Natural Resources	0.05	1.00
		Science	0.11	1.00

CHAPTER FIVE

DISCUSSION

The purpose of this study was to examine three aspects of online academic advising. Specifically, this study focused on the type of advising (prescriptive vs. developmental) that students receive, the type of information that students seek, and the overall level of satisfaction they express when receiving academic advice online. These three aspects were then analyzed and the data were compared to one another based on gender, race, type of residency, and academic college. The study made use of a modified version of Winston and Sandor's Academic Advising Inventory (1984).

This chapter provides a discussion of the study and its results, the relationship of those results to prior research, as well as the limitations of the study and implications for future practice, research, and policy. Finally, conclusions from the study are presented.

The present study addressed a gap in the literature between academic advising and student Internet use in higher education. Specifically, this study examined online academic advising as a means of developing more effective online academic advising techniques. The research questions posed in this study can be grouped into three topic areas: a) type of advising, b) type of information sought during online academic advising, and c) the level of satisfaction experienced by students who receive online academic advising. This discussion will focus on each of these topics and discuss the significant discoveries made within each topic.

Type of Advising

Five of the research questions posed in this study focused on the type of advising (prescriptive or developmental) received by participants when receiving academic advice online. To address this portion of the study, the researcher examined the means and standard deviations

of the responses to the 13 items contained in Part I of the OOAI. The 13 items made up one large scale, the Developmental-Prescriptive (DPA) scale, and three subscales. The three subscales were the Personalizing Education (PE) subscale, the Academic Decision Making (ADM) subscale, and the Selecting Courses (SC) subscale. The responses to each item ranged from 1 to 8. The number of items per scale varied. Therefore, the range of mean scores varied based on the number of items dedicated to each scale. The DPA scale contained all 13 items. The scores ranged from 13 to 104. The three subscales each contained a portion of the items. The PE subscale contained seven items. The scores ranged from 7 to 56. The ADM subscale contained four items. The scores ranged from 4 to 32. Finally, the SC subscale contained two items and had a range from 2 to 16. Among the scales, the data indicated that participants received developmental advising on three of the four scales. Those scales were the DPA scale (m = 60.67), the ADM subscale (m = 21.38), and the SC subscale (m = 11.62). The data also indicated that respondents received prescriptive advising on the PE subscale (m = 27.67).

These findings are interesting for a couple of reasons. First, the results contradict a relationship found in previous literature. Crookston (1972) suggests that students who seek out answers in a short amount of time are accustomed to receiving a prescriptive or treatment style of advising. The types of information sought by these students include: (a) clarifying graduation requirements, (b) discussing course selection, (c) organizing a course of study, (d) discussing educational goals, (e) exploring career possibilities, and (f) explaining registration (Fielstein, 1989). The data collected during this study suggested that students now seek information online to help guide their decision making process instead of dictate it. This would suggest a growing trend away from prescriptive advising and more towards developmental advising.

However, it is equally important to consider the standard deviations on each scale measured by Part I of the OOAI. These standard deviations were very large and ranged from 2.87 (Selecting Courses subscale) to 12.61 (Developmental-Prescriptive Advising scale). These large deviations would suggest the possibility that students do still receive prescriptive advising when seeking advice online. For example, on the Developmental-Prescriptive Advising, some participants responded with a total of 97.00 suggesting they experience a developmental style of academic advising online, while other participants responded with a total as low as 44.00. This wide range implies that some participants still receive a prescriptive style of advising online while other participants are now using the online academic advice as a guide to help make their own decisions.

The fourth research question examined if there were differences in the type of academic advising received by gender. Female participants were found to have received developmental advising more often than male participants on two scales, Academic Decision Making and Selecting Courses. This finding supported existing research that females prefer a more developmental style of advising than males (Crockett & Crawford, 1989). The data showed that as females begin to make decisions about their major, course schedule, or academic future they sought out more guidance than prescription when receiving advice online.

The next research question focused on the differences in type of advising received by type of residence. No significant differences were found among respondents in any of the four scales. For both on-campus and off-campus participants, mean scores did not vary much from the average mean scores.

The fact that there were no significant differences in the type of advising by residence type was surprising for a couple reasons. First, participants who live off-campus subject

themselves to a different lifestyle than the one experienced by on-campus participants. Off-campus respondents have different physical and emotional needs (Wolfe, 1993). Many off-campus respondents have additional demands on their time including family, education, employment, and finances (Wolfe, 1993). Each of these needs and demands influence the level of development possessed by off-campus students. Since many on-campus students do not share these demands, the style of advising they receive may be different. However, the data collected in this study support the fact that all participants sought and received the same style of advising for each scale regardless of residency type.

Another interesting observation about this portion of the data deals with consistency. The results of this study illustrated that academic departments provide a consistent advising style to all students regardless of type of residency. This is significant because participants who live on campus have easier access to faculty members and advisors than participants who live off-campus. One limitation of this study is that participant responses may have been influenced by the ability to meet face-to-face with advisors. The results for this question supported the fact that even though off-campus students did not have the same access to face-to-face advising, the type of advising received via the online academic advising provided by their department was still the same.

The sixth research question addressed differences in the type of academic advising received online by race. Majority respondents reported receiving developmental advising more often on two scales, Academic Decision Making and Selecting Courses. This is intriguing because the ADM and SC subscales focus on information that is typically presented in a very dualistic, prescriptive fashion. These findings contradict this trend although the large standard deviations should be taken into consideration for this question too.

The findings support existing research examining the needs and preferred academic advising styles of minority students. Research has shown that a demonstrated sensitivity for adjustment should be considered when advising African American students. This consideration in combination with developmental advising styles enables the institution to respond to student needs and concerns on a more individual basis (Burrell & Trombley; 1983; Herndon, 2001; Littleton, 2001; Moore, 2001; Schweitzer, Griffin, Ancis, and Thomas., 1999).

Additionally, the information was collected at a predominantly white institution (PWI) in the mid-Atlantic region. The overwhelming number of majority responses in comparison to minority responses may have skewed the results of this study. This is a limitation that will be discussed later in this chapter.

Finally, the seventh research question looked to determine if there was a difference in the type of academic advising received online by academic college. Significant differences were found between particular academic colleges on two scales: the Developmental-Prescriptive Advising scale and the Personalizing Education subscale. These findings are interesting because they provide some insight into the methods, goals, and outcomes of the online academic advising provided by each academic college.

A significant difference was observed on the Developmental-Prescriptive Advising scale and the Personalizing Education subscale. On both scales, participants from the College of Business reported receiving developmental advising on fewer items than participants from the other two academic colleges. This observation may reflect on the efforts made by the College of Natural Resources and, particularly, University Studies. Respondents who are enrolled in the University Studies program were still attempting to identify a major. Previous research states that undecided students require a more developmental approach to advising because of their needs,

environment, and ability to make a decision for themselves (Gordon 1981, 1984). The topics addressed and the information provided via online academic advising may differ greatly with University Studies since participants from the College of Business must identify a major within their first year and University Studies students do not. Students who have identified a major may have had different needs and expectations when receiving academic advice online.

Type of Information

Five of the research questions posed in this study focused on the type information participants seek when receiving academic advice online. To address this portion of the study, the researcher examined the means and standard deviations of the responses to the 28 items contained in Part II of the OOAI. The 28 items made up five scales: a) Personal Development and Interpersonal Relationships (PDIR), b) Exploring Institutional Policies (EIP), c) Registration and Class Scheduling (RCS), d) Teaching Personal Skills (TPS), and e) Academic Majors and Courses (AMC). Each scale contained a different number of items. The range for each scale item ranged from zero to five. As a result, the higher the mean score, the more often participants sought information from that scale. Among the scales, the data indicated that participants sought information from two scales more often than the other scales. Those scales were the Academic Majors and Courses (AMC) scale (m = 1.68) and the Teaching Personal Skills (TPS) scale (m = 1.65). Example topics from the AMC scale include academic majors, concentrations, course content, and more. The TPS scale included items such as study skills, college policies, and other personal concerns or problems. However, after conducting the T-test no significant differences were found between the mean scores of the scales. Participants sought information from one scale nearly as often as they sought information from another scale.

The eighth research question determined if there were differences in the type of information sought via online academic advising by gender. Male respondents reported receiving information connected with the PDIR scale more often than female respondents. This finding is very interesting because existing research suggests female participants sought information connected with this scale more often due to their natural help-seeking behaviors (Alexitch, 2002; Jackson, Ervin, Gardner, & Schmitt, N., 2001; Morahan-Martin & Schumacher, 2000). However, since females already possess a tendency to use the Internet for interpersonal purposes more frequently they may seek out information about this topic less (Jackson, et al., 2001). If male students felt they have more to learn about interpersonal skills then this finding seems appropriate. Further research would allow for more insight into this issue.

The next research question sought to find any differences in the type of information sought via online academic advising by type of residency. Again, no significant differences were found between participants who lived on-campus and participants who lived off-campus. This observation is intriguing because existing research shows that the needs for these two groups are very different (Hybertson, Hulme, Smith, & Holton, 1992). The mean scores between each group are very similar to one another. However, the results show that participants from each group obtained information from the RCS scale much more often than information from the other four scales. Respondents used online academic advising to seek information about course registration and scheduling most often.

The institution where the study was conducted is a very technology focused institution. The course catalog, course timetable, and course registration process are all supported online. The only way to access the information is by using the Internet. This focus on Internet use may have influenced the data in this particular instance.

The tenth research question attempted to determine if there were any differences in the type of information sought through online academic advising by race. No significant differences were found between the responses of majority and minority participants. This finding supports existing research that most students use the Internet to seek out similar information and purposes (Ham & Davey, 2005; Jackson, Ervin, Gardner, & Schmitt, 2001; Kirkwood & Price, 2005; Malaney, 2004; Morahan-Martin & Schumacher, 2000; Tenorio, 2003). Therefore, having students seek similar information via online academic advising regardless of their race is a reasonable observation. Regardless, the fact that the institution relies heavily on the Internet to provide course information and to facilitate the course registration process may have influenced these results as well.

Finally, the eleventh research question intended to discover if differences existed in the type of information sought via online academic advising by academic college. Participants from University Studies reported obtaining information from the TPS scale more often than participants from the College of Business, College of Engineering, and College of Agriculture and Life Sciences. This finding illustrates the fact that students enrolled in University Studies were still actively making a decision about their plan of study and future direction. The academic advising that is provided online by University Studies may have had a very different approach or focus than the advising provided online by the other three colleges listed above. Based on existing research, students who are still making important decisions about their major may require more information about personal skills than students who have already chosen a major and begun their plan of study (Gordon, 1981, 1984). Future research will provide more information on this observation.

Overall Satisfaction

Five of the research questions posed in this study focused on the level of satisfaction participants experience after receiving academic advice online. To address this portion of the study, the researcher examined the means and standard deviations of the responses to the five items contained in Part III of the OOAI. The response options for each item ranged from 1 (strongly disagree) to 4 (strongly agree). As a result, the higher the mean score, the more satisfied participants were with that aspect of their online academic advising experiences. Among the scales, the data indicated that participants were moderately satisfied with all five aspects of their experience. The item receiving the highest level of satisfaction was the item related to sufficient notice of deadlines related to institutional policies and procedures (m = 3.00).

The twelfth research question of this study sought to identify any differences between the levels of satisfaction by gender. No significant differences were discovered between the responses of male and female respondents. Even though the needs of male students and female students differ, both groups were able to find the information necessary when receiving advice online. Therefore, both groups expressed similar levels of satisfaction with their experience.

The next research question was intended to discover any difference between the level of satisfaction and type of residency. On-campus participants reported a level of satisfaction for all five items similar to those responses of off-campus participants. No significant differences were found between the two groups. However, one trend to note is that on-campus respondents reported a higher mean score than off-campus respondents on four of the five items. The item with the largest differences between mean scores was Sufficient Notice of Deadlines. On-campus students (m = 3.06) responded that they were more satisfied with the notice they

received than off-campus students (m = 2.92). The one item that did not fall into this trend was the overall availability of the online academic advising. Off-campus participants (m = 2.91) reported being more satisfied with the availability of academic advising online than on-campus participants (m = 2.85). This response may be related to off-campus participants making use of online advising more often than on-campus participants who have greater access to face-to-face advising.

The fourteenth research question looked to determine if there were any differences between the level of satisfaction and race. The results showed significant differences (p < 0.05) in the mean scores between groups for two items. Majority participants expressed a great level of satisfaction on the items referring to sufficient notice of deadlines (m = 3.05) and sufficient amount of time dedicated to advising (m = 2.85). Minority participants responded that they were also satisfied with notice of deadlines (m = 2.82) and amount of time dedicated to advising (m = 2.60), but not to the same extent as the majority participants. These findings could relate to existing research that discusses computer literacy levels among minority computer users in college (Sax, Ceja, & Teranishi, 2001. If many minority computer users express a lower level of computer literacy then the experiences they have when receiving academic advice online may not be the same as the experiences more computer literate users have.

The three items that did not illustrate a significance difference were: a) General Satisfaction, b) Availability, and c) Accuracy of Information. A significant difference was found on the remaining two items: a) Sufficient Notification of Deadlines and b) Sufficient Amount of Time. These two items focused more on the method being used or the timeliness thereof rather than the content of the advising provided. I believe these results are directly related to the literacy of the participant. The more computer literate students currently are the

less time they may need during the online academic advising experience. If students are less computer literate, then they may struggle with the online experience and require more time to meet their needs. A study comparing the computer literacy of participants to their expressed level of satisfaction would help to verify this hypothesis.

Finally, the last research question of the study determined whether there was a difference between levels of satisfaction and academic college. A significant difference ($p < .05$) was found on three of the five items: Accurate Information, Sufficient Notice of Deadlines, and Availability. Participants from the College of Engineering (m = 3.12) reported a higher level of satisfaction with the accuracy of the information they receive than participants from the College of Business (m = 2.77). In regards to sufficient notice of deadlines, participants from the College of Engineering (m = 3.19) and University Studies (m = 3.25) both reported significantly higher levels of satisfaction with the deadline notices they received than participants from the College of Business (m = 2.76). Finally, respondents from the College of Engineering also reported a higher level of satisfaction with the availability of online advising. Participants from the College of Engineering (m = 3.07) reported a significantly higher level of satisfaction than participants from the College of Architecture and Urban Studies (m = 2.33) and the College of Business (m = 2.69).

These findings are very important to this study because they shed some light on the impact each college's online academic advising has on its respective participants. Academic colleges do not provide identical forms of online academic advising. Some of the colleges offered online advising through instant messaging while others provided online support through email or websites. Other colleges may have implemented a combination of methods instead of focusing their online advising through one medium. These results can help the academic

colleges improve or adjust the current online academic advising in an effort to better support the needs of their students.

Relationship to Prior Research

When reviewing previous research in relation to the present study, two patterns emerged. In some instances, the findings in this study supported prior research. In other instances, the present findings contradicted previous research.

The present findings related to the type of advising received by male and female participants indicated that female students received more developmental advising than male students. There is a substantial body of literature with regards to differences in the preferred type of advising by gender (Alexitch, 1997, 2002; Crockett & Crawford, 1989; Frost, 1991). Prior studies show that female students prefer and respond better to developmental advising than male students. Female students prefer more discussion and opportunities to self-explore their academic careers. This is supported by their natural help-seeking ability (Jackson et al., 2001). Male students do not possess a deep help-seeking ability and tend to prefer a more prescriptive style of advising (Jackson et al., 2001). The findings of this study support this research and provide a practical application of how the discoveries of prior research can be related to the online advising environment.

On a similar note, the findings of this study referring to the type of information sought by male and female students showed that male students seek information from the Personal Development and Interpersonal Relationships scale more often than female students. The same existing research that discusses the style of advising differences also mentions the fact that females already use the Internet for more interpersonal purposes than males (Malaney, 2004; Jackson, et al., 2001). There are two reasons why males may seek information from the PDIR

scale more frequently: a) female students are already comfortable with their interpersonal skills, or b) female students are not comfortable enough with the online environment to seek out that kind of information online (Jackson, et al., 2001; Malaney, 2004). Regardless, the findings of the present study support these existing differences between male and female Internet use and advising preferences.

Another substantial body of literature exists discussing the type of information and reasons that students use the Internet. The existing research states that students use the Internet for similar purposes regardless of race (Ham & Davey, 2005; Jackson, et al., 2001; Jones, 2002; Kirkwood & Price, 2005; Malaney, 2004; Morahan-Martin & Schumacher, 2000; Tenorio, 2003). The findings of this research indicate that students that majority students seek information from each scale just as often as minority students. Regardless of their race, students seek the same types of information when receiving online academic advising online.

Finally, the findings of this study support existing research discussing the effects of access and availability of computers to minority students when faced with computer literacy and success. A small body of existing research discusses the influence of lower socioeconomic status and minority backgrounds on the level of computer preparedness that students posses at the college level. The amount of time spent on the Internet is not as high for these students college (Sax, Ceja, & Teranishi, 2001). The findings of this research do not support the previous research directly but some connections can be made. The results of the present study indicate that minority students are not as satisfied with their online academic advising experiences when dealing with the notification of deadlines and the total amount of time the online advising is available. The researcher argues that some connection can be made between the two because a student who is not as well versed with computers may require more time and notice than students

who use computers frequently. Those students who do not receive that additional time may then express lower levels of satisfaction with their experience. This is one instance where each college providing a consistent method of academic advising online may not be successful for all students. Conversely, there are a couple findings in the present study that do not support existing research.

The first major contradiction of existing research focuses on the type of advising students receive when obtaining academic advice online. The basis of online academic advising is for the student to gain access to academic information and advice by means of their personal computer. The assumption would be that since the participant is being told information then the style of advising received would be more prescriptive than developmental. However, the findings of the present study contradicted this assumption. Instead, participants in the present study reported receiving developmental advising online more than prescriptive advising. Without the face-to-face aspect of the advising session, students may be making more decisions for themselves based on the information that they retrieve online as opposed to having an academic advisor actually sit down and tell the participant what he or she should do. Therefore, the use of online academic advising may actually lead to an increase in self-awareness and responsibility among students. Further research in this area would help to verify this assumption.

The results of the present study indicated that the type of residency (on-campus or off-campus) has no influence on the type of advising received, type of information sought, or level of satisfaction expressed by students who identify with either group. There is a large body of existing research that discusses the different needs, influences, and demands between on-campus and off-campus students (Andreas, 1983; Hybertson, Hulme, Smith, & Holton, 1992; Imel, 1998; Kirkwood & Price, 2005; Tenorio, 2003; Wei & Johnes, 2005; Wolfe, 1993). The numerous

differences in needs, influences, learning styles, and preferences discussed in the previous

research would lead to a belief that on-campus students would prefer a different advising style or

seek different information than off-campus students. However, the results of this study indicate

that this is not the case. Instead, participants from both groups responded similarly.

Limitations

Several limitations to this study should be noted. One is related to the response rate.

Since the participants were contacted through their academic deans and advisors, the researcher

was unable to determine how many students were contacted originally. Assuming that every

undergraduate student was contacted by their academic dean then the response rate for each

academic college would be: (a) Agriculture and Life Sciences; 0.6%, (b) Architecture and Urban

Studies; 0.6%, (c) Business; 2.9%, (d) Engineering; 1.4%, (e) Liberal Arts and Human Sciences;

0.5%, (f) Natural Resources; 7.2%, (g) Science; 0.6%, and (h) University Studies; 2.1%. It is

possible that some academic deans or advisors chose not to distribute the link to the online

survey. Therefore, these response rates are very conservative.

A second limitation to the study involved the respondents themselves. Since the study

asked participants to self-report about their online academic advising experiences, it is possible

that they may or may not have responded candidly to the items in the OOAI. If this occurred, the

means on each scale may not have accurately reflected the type of advising received, the type of

information sought, or the overall level of satisfaction experienced by the participants in this

study.   If this occurred, the results may have been skewed.

Another limitation involved the modification of the original instrument. The original

instrument used for the present study was Winston and Sandor's Academic Advising Inventory

(1984). The AAI was modified to meet the needs of this study. Item 10 was removed from Part

I. Item 37 and Item 44 were removed from Part II of the original AAI. The removal of these three items changed the number of total items included in the instrument, but, based on the AAI Manual, should not have effected the reliability or validity of the instrument. Another modification of the original AAI took place in the language used. Every instance of "academic advisor" in the original instrument was replaced with "online academic advising."

A second reliability test was conducted on the data to confirm that the instrument was still valid and reliable. The Cronbach Alpha procedure was used to estimate the internal consistency reliability for the Developmental-Prescriptive Advising Scale and its subscales: (a) Personalizing Education (PE), (b) Academic Decision-Making (ADM), and (c) Selecting Courses (SC). The alpha coefficients for the procedure ranged from .32 for the ADM subscale to .60 for the PE subscale. The alpha coefficient for the total Developmental-Prescriptive Advising Scale was estimated to be .64. These coefficients are only slightly less than the original alpha coefficients reported by Winston and Sandor (2002).

A fourth limitation involved the presentation of the instrument online. Part I of the OAAI involved two statements per item. Participants were asked to select a statement and then decide how true the selected statement was to them. On paper, this part of the instrument was much clearer. When the instrument was placed online the presentation of Part I may not have been as clear as the paper version. If this were the case, the results for this portion of the instrument may have been skewed.

Computer experience and participant comfort with technology were both uncontrolled variables in this study and therefore may have also affected the results. A participant who has been working with computers for the past decade may have responded differently to items in the instrument. For example, a participant who has only been working with computers a few months

may have experienced more difficulty with the online advising experience. A similar conclusion can be drawn when considering the academic standing of the participants in this study. Approximately fifty-five percent (55%) of the respondents were first and second year students at the institution. Those students may not be nearly as comfortable with the online academic advising opportunities available to them when compared to a third or fourth year student at the institution. A solution to this limitation would have been to measure the level of computer experience or comfort with technology prior to allowing the respondent to participate in the study.

Finally, the institution where the study took place could be seen as a limitation. This study was conducted at a predominantly white institution in the mid-Atlantic. The number of non-White participants who decided to respond was minimal enough to require the researcher to consolidate the original seven minority categories into one large minority category. In addition, the institution where the study was conducted maintains conducted maintains a strong emphasis on technology in all areas of the curriculum. For example, students are required to purchase a personal computer when they enroll and most classes provide websites to support the students' studies. This focus on technology and lack of minority respondents may have each skewed the results of this study.

Although the study did have several limitations, they did not detract from the overall benefit of the study. The current study was useful because it examined an area of academic advising that had not yet been explored and the findings can inform future accomplishments.

<p align="center">Implications</p>

The present study had implications for practice, policy, and research. The findings have several implications for those who provide online academic advising for students or design the

mediums used to provide academic advising to students through the Internet. For academic advisors who provide advice online, the findings suggest that students take advantage of the developmental advising aspects of the online advice more than the prescriptive advising style. This is important to consider when deciding on the type of information to provide and how to provide it. If students are using online academic advice as a resource and less as a standard then academic advisors should focus efforts on providing as much information as possible online instead of only providing a couple set plans or standards.

For those who work with a majority male population, the findings of this study suggest that male students are seeking information and advice about personal development and building interpersonal relationships more than female students. An academic college with a majority of male students, such as the College of Engineering, may want to consider offering more information and opportunities for its students to learn new personal skills and networking.

Any department or office that focuses on providing online resources to students who live off-campus may also find the results of this study beneficial. The findings of this study indicated that most students seek the same type of information online regardless of their type of residency. If a department or office only focuses on meeting the needs currently discussed in prior research, they may want to consider expanding the information they provide through online advising to also include the needs frequently stereotyped to on-campus students.

Finally, any academic college with a curriculum similar to those who participated in this study could make use of the present study's findings. The results of this study indicated that the advising provided by University Studies or undeclared majors provided more advice for personal skills than the College of Engineering and the College of Business. Similar academic colleges

may consider more information and online advising opportunities to help students who have already chosen majors to build stronger personal skills.

Senior level administrators at all levels could benefit from this study as well. The moderate levels of satisfaction expressed in several findings supports the idea that online academic advising can be a successful endeavor for an institution. Administrators may consider implementing online academic advising at their institution to help satisfy the needs of the students and to match the convenience with which they have already become acquainted.

Administrators who spend lots of time working with minority students could also use the findings of this study to their advantage. Prior research shows that students from low socioeconomic and minority backgrounds may not be as prepared to work with a computer as frequently as majority students. The findings from this study show that minority students are less satisfied with the time available for their online advising. This may be a direct result of their need for more time due to lack of experience working with computers or the online environment. Administrators can make use of these results to modify their current advising techniques for minority students or to provide programs of support to help overcome a possible illiteracy concern. Existing research shows that making an effort to meet the needs of the students will increase retention of those students at the institution (Giles-Gee, 1989; Young and Rogers, 1991).

In terms of policy, the Council for the Advancement of Standards for Student Services/Development Programs (CAS) would benefit from the results of this study. The results of this study highlight the types of advising different groups of students prefer, the types of information those same groups of students seek, and how satisfied they are with the current

online academic advising environments. CAS could use these findings to assist them in generating standards of practice for the online academic advising environment.

Additionally, college administrators might encourage further evaluation and assessment among institutions of higher education. With so many colleges and universities implementing online academic advising, simply assessing similar aspects within the institution may not be going far enough. Administrators from different colleges and universities might institute studies of their own and then share their results to compare outcomes and accurately assess the progress of online academic advising at several different institutions.

Finally, this study had implications for future research. This study measured the type of advising, type of information, and level of satisfaction experienced by participants in a very quantitative manner. A future study might include a qualitative study to gain further clarity about the interactions experienced online and the mediums used. This would provide more details and allow for researchers to elaborate on the successful and unsuccessful aspects of online academic advising.

Even though this study examined the methods used to receive academic advice online and how often a participant received advice online, the information was never used in the analysis of the results.   A future study could use those pieces of data to seek out whether a relationship exists between the type of advising, type of information, overall satisfaction and the frequency or medium used when receiving advice. Such a study would allow researchers to determine if students who seek advice online a) experience a different type of academic advising, b) seek out different information than those students who only experience online advising periodically, or c) experience a greater level of satisfaction with their experience.

This study helped to identify the differences in online academic advising between academic colleges. Future research could focus on each academic college individually through qualitative data collection and analysis. Such a study would allow for colleges to focus on individual aspects of their online academic advising to improve their overall advising opportunities.

This study took place at a large, research institution. Future studies could expand on these data to examine the online academic advising opportunities and experiences at other institutional types such as community colleges, liberal arts institutions, and small private colleges). This would provide a more complete picture of the overall online advising experience.

Finally, this study examined a fairly homogenous sample of students. The failure to find significant differences by race may have had to do with the characteristics of the sample. Minorities were underrepresented in the study. Future studies could attempt to include a more diverse sample by race or other demographic characteristics including socio-economic status. This may indicate whether other characteristics influence the type of advising, type of information, or level of satisfaction expressed by students.

Conclusion

In conclusion, the findings of the present study revealed a moderate level of satisfaction and consistency among the online academic advising experiences of participants. The results highlighted some specific areas of significance including the shift from prescriptive to developmental advising, the need for personal development and skills by men, and the discovery that on-campus and off-campus respondents share more similar preferences than prior research indicates. Other findings from this study provided academic colleges with a new assessment of their current online academic advising opportunities. This assessment allowed academic

colleges to evaluate their actions and redesign their online academic advising methods to better meet the needs of their students.

Two important concepts to keep in mind when considering this study are academic culture and types of significance. The respondents in this study were representative of many different academic colleges, plans of studies, and methods of thought. Some in academia may focus more on personal interactions and face-to-face advising. For example, engineering students will spend much more time interacting with computers than liberal arts students. Faculty members from the College of Liberal Arts and Human Sciences may choose to hold the personal interactions with more value in an effort to provide individualized attention to its students. The academic culture should be taken into consideration when deciding how practical the results of this study may or may not be. This study acknowledged many findings of statistical significance including differences in gender, race, and academic college. These discoveries provide a strong foundation for future studies to expand upon and study in qualitative detail. However, even though some results may have proven statistically significant, I encourage any researcher to consider the practical significance of these results before committing to future studies.

In institutions of higher education today, the use of the Internet by students and the importance of academic advising are not often connected. Students are beginning to combine the two resources as they prefer the convenience of the computer but require the assistance of their academic advisor. As a result, online academic advising is becoming more prominent and significant on campuses across the country. This study addressed the gap between student Internet use and academic advising.

To this point, no research had existed to address the type of advising, type of information, and overall satisfaction experienced by students who received academic advice online. This study fills that gap and helps make the connection between student Internet use and academic advising. A foundation has now been established to support future research on online academic advising. It is important that institutions of higher education take notice of this study and support future studies that expand on its findings. By doing so, institutions will be able to adjust to the needs of the students and supply the most effective online academic advising experience possible.