ENGAGEMENT IN ACADEMIC ADVISING: A COMPARISON BETWEEN STUDENTS IN INTERDISCIPLINARY PROGRAMS AND STUDENTS IN NONINTERDISCIPLINARY PROGRAMS

by

Stephen G. Pajewski

B.S., Grove City College, 1983

B.A., University of Pittsburgh, 1988

M.A., University of Pittsburgh, 1992

Submitted to the Graduate Faculty of

The School of Education in partial fulfillment

of the requirements for the degree of

Doctor of Education

University of Pittsburgh

2006

UNIVERSITY OF PITTSBURGH

SCHOOL OF EDUCATION

This dissertation was presented

by

Stephen G. Pajewski

It was defended on

November 27, 2006

and approved by

Dr. Glenn M. Nelson

Dr. John L. Yeager

Dr. Indira Nair

Dissertation Advisor: Dr. John C. Weidman, II

ENGAGEMENT IN ACADEMIC ADVISING:
A COMPARISON BETWEEN STUDENTS IN INTERDISCIPLINARY PROGRAMS AND STUDENTS IN NONINTERDISCIPLINARY PROGRAMS

Stephen G. Pajewski, EdD

University of Pittsburgh, 2006

This study examined the academic advising experiences of students in undergraduate interdisciplinary majors at a private research university and observed whether these students engage in advising in ways that are different from those of students whose primary academic majors are not interdisciplinary.

The data consisted of responses to a student survey of advising at the university (n = 2,461, or 48% of the undergraduate population). Overall, interdisciplinary students were more engaged in advising than the others. Compared to noninterdisciplinary students, they visited their advisors more often, they contacted their advisor for a wider range of reasons, and their sense of the overall quality of advising received was higher. They also placed greater importance on certain advisor competencies (such as guidance in noncurricular opportunities) and personal characteristics than did noninterdisciplinary students.

In addition, the noninterdisciplinary students were divided into their eight areas of study (business administration, computer science, engineering, fine arts, humanities, natural & physical sciences, social sciences, and undecided). Each area was compared to the interdisciplinary students for the same variables. Interdisciplinary ranked in the top half for all of the nineteen variables.

This study also found that engagement with advising may be significantly influenced by the type of advising model used by individual academic departments and programs. Since data

were used from just one institution, the characteristics of this institution's advising models likely have more of an effect on students' responses than their fields of study.

Observations from this study may be used to enhance advising effectiveness in interdisciplinary programs. With students in these programs having higher expectations for advising than students in other programs, advisors need to be well-prepared. Training should ensure that advisors are well-informed of the learning outcomes of interdisciplinary study and can communicate them to students.

Further research on student experiences with advising models may contribute to understanding factors affecting advising quality. As for interdisciplinary programs, further study from other institutions with such programs can contribute to understanding how to serve their students with advising. Researching what kinds of students seek enrollment into interdisciplinary programs may also effective.

ACKNOWLEDGEMENTS

I have received overwhelming support from persons without whom I would not have been able to accomplish this milestone in my education. I first would like to acknowledge my Lord and Savior, who is my source of strength and guidance, and provider of all the blessings in my life.

I would like to thank my dear wife, Pye, for her unconditional love and support. I don't think either of us knew just how much sacrifice, patience, and devotion would be required to complete this study. I also thank my two daughters, Annelise and Emma, for their understanding, love, and support, and for waiting patiently for my attention.

I would like to thank my committee chair and program advisor, Dr. John C. Weidman II, who has provided wisdom and guidance for this research and for my completion of doctoral study. I also thank my committee members: Dr. Glenn Nelson, who has kindly agreed to continue to participate while transitioning into retirement; Dr. John Yeager for his thought-provoking questions; and Dr. Indira Nair, for her gracious mentoring and insights into academic advising.

I would also like to acknowledge and thank Dr. Elaine Rubinstein for her kind support and sharing of her expertise in statistical data analysis and SPSS software.

Lastly, I thank the university that allowed me to use its student survey data for this study.

TABLE OF CONTENTS

LIST OF TABLES

I. INTRODUCTION

This study examines the academic advising experiences of undergraduate students at one university campus and examines whether students enrolled in interdisciplinary majors engage in academic advising in ways that are different from those of students whose primary academic majors are not interdisciplinary. Knowledge of these differences will lead to a better understanding of the type of guidance students seek in interdisciplinary programs, and can help advisors in such programs to better serve their students. The study will use data from a survey of undergraduate students on the subject of academic advising conducted in April 2004 at a private research university. The survey asked students about the nature of their relationship with their advisor and how they receive guidance. It also asked them to determine the levels of importance of, and satisfaction with, certain characteristics of their academic advisor. This study will disaggregate the survey data according to the respondents' areas of study and compare their responses to determine the differences, if any, in their engagement with academic advising.

A. DISCIPLINARY AND INTERDISCIPLINARY EDUCATION

Based on the literature, a major assumption of this study is that undergraduate interdisciplinary study demands more complex learning outcomes for its students than the demands in the traditional disciplines. This assumption, therefore, argues that these differences in turn require advisors to take into consideration the demands in advising

made by students in interdisciplinary study. This section defines disciplinary and interdisciplinary education.

Undergraduate education is organized traditionally around the idea that students will focus their learning on at least one specific academic field of study, a specialization known commonly as a "major." Specializations can range from the traditional academic disciplines such as those in the liberal arts and sciences (music, art, philosophy, and chemistry, for instance), to majors that prepare students for "professional" or "applied" fields of study (such as engineering, business administration, and nursing).

Organizing an education based on a discipline or field of study accomplishes a number of pedagogical and curricular objectives: each discipline requires students to focus on specific phenomena, to approach this phenomena with specific analytical and descriptive methodologies, to have specific aims, and "to employ specific conceptual frameworks and vocabularies" (Marion, 2003, n.p.). The outcome for both the college graduate and for society in general is that the completion of a major certifies that the graduate has attained a specific level of expertise, or mastery, in that discipline.

Educators continue to debate the effectiveness of organizing knowledge into disciplinary categories, as well as the definitions of, and boundaries between, these categories (Klein & Newell, 1997). There are educators who advocate the concept of interdisciplinary study, based on the view that the world itself does not exist as separate disciplines or fields of study, and that all knowledge is systematically integrated. Moreover, interdisciplinary study is considered a means of framing and solving problems that cannot be addressed using single methods or approaches (Klein, 1990).

Interdisciplinarity is an approach to learning that has numerous definitions and forms, as it "has been variously defined in this century" (Klein, 1990). One general description finds it to be "a process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with" by a discipline or specialization (Newell, 1996, p 3). Its early practice has been found mostly in research and scholarship conducted at the professional level.

Interdisciplinary study has had an increasing presence in undergraduate education in the past three decades as colleges and universities have added interdisciplinary programs in areas such as Women's Studies, Information Systems, and International Relations. Colleges and universities continue to be encouraged by educators to offer courses, curricula, and major programs that are interdisciplinary in nature. Edwards' (1996) inventory of academic programs in the U.S. show that about half of the colleges and universities have interdisciplinary components to their liberal arts programs.

This rise in interdisciplinary education has been under extensive examination recently (Newell, 1996; Klein, 1999; Lattuca, 2001). Despite this examination, the literature on interdisciplinary education shows that little research attention has been paid to the way students are advised in such programs, and the effect of advising on students in such programs. Interdisciplinary education claims to have pedagogies and curricula that are distinctly different from the non-interdisciplinary, or "traditional" disciplines. This should result in different advising strategies between interdisciplinary and traditional disciplinary programs.

A curriculum requiring students to cross disciplinary boundaries can present complex learning objectives. These may include the use of multiple methodologies for

learning problem-solving skills, and the need to integrate or synthesize knowledge claims taken from two or more disciplines. These objectives may be different from the objectives of the curricula of individual traditional disciplines. In their research in understanding the way knowledge is structured and how experts think in specific disciplines, Middendorf and Pace (2004) write: “Thus, we have only begun to understand what kinds of thinking goes on in different disciplines, nor do we know the similarities and differences across the disciplines” (p. 2). The extensive examination of interdisciplinary education in the past decade have focused on these curricular and pedagogical differences (Newell, 1996; Lattuca, 2001; Klein, 1999).

Guiding students by way of academic advising is crucial to meeting these complex learning objectives of interdisciplinary study. Payne (1998) writes that the types of faculty who are attracted to interdisciplinary study tolerate ambiguity, are self-motivated, broadly educated, and are dissatisfied with the constraints placed on their intellectual work. These defining characteristics may be found in mature adults who are teachers and researchers, but are undergraduate students prepared for this type of learning model? Are students made aware of the challenges, the goals, and structures of such programs from either their advisors, their college admissions staff, or their high school programs? Interdisciplinary study is often described in terms of hardship and journeying, as these article and book titles suggest: “Barriers to Interdisciplinarity” (Bradbeer, 1999), “Negotiating a Passage Between Disciplinary Borders (Wissoker, 2000), and “Crossing Boundaries” (Klein, 1996). Wissoker writes that “Interdisciplinary work needs to be seen as a compromise,” and that “interdisciplinary spaces are hard to construct and maintain (p. 1).” Writing about the barriers to interdisciplinary study, the Boyer Commission

(1998) found that “Students who find that existing majors do not suit their interests often encounter discouraging barriers; advisors will likely first try to fit those interests into one of the existing patterns” (p. 23). Klein (1999) offers a list of administrative strategies for supporting students, such as loosening structural barriers and clustering programs.

Haynes (2002) writes that interdisciplinary study is “concerned primarily in fostering in students a sense of self-authorship and a notion of knowledge that they can use to respond to complex questions, issues, or problems.” Elsley (2002) recognizes that the expressions of such goals are quite lofty, and surmises that not all undergraduate students can rise to this challenge. To what extent are students prepared to achieve such learning outcomes from interdisciplinary study? A criticism of interdisciplinary programs is that the quality of interdisciplinary study can be a concern (Lattuca, 2001). Klein (1996) points out that departments fail to develop the integrative skills students need for dealing with complex problems and issues. Institutions that expects interdisciplinary study to thrive on their campus need to do more than support its scholarship; they need to “create flexible spaces” for exploration and collaboration (Lattuca, p. 259). In addition to producing scholarship and teaching, programs need to offer personal guidance to students for establishing their educational and professional goals in these interdisciplinary fields of study. The advising of these students plays a key role in the students’ achievement of these interdisciplinary learning outcomes.

B. ACADEMIC ADVISING

Students, advisors, administrators, and researchers recognize that advising plays an essential role in undergraduate education. The literature has many examples

advocating that advising quality influences such elements as students' transition to college life (Steele & McDonald, 2000), decision-making for selection of majors and career paths (Creamer, 2000; McCalla-Wriggins, 2000) and achieving educational, personal, and professional goals (Crookston, 1994; O'Banion, 1994, Light, 2001; Cuseo, 2004). The effects of effective advising are shown to have a positive impact on students' academic success, satisfaction, and retention (Light; 2001; Gordon & Habley, 2000; Pascarella & Terenzini, 1991).

Educators find advising to be integral to the educational mission of colleges and universities, and that advising is an intentional process, grounded in teaching and learning (White, 2000; CAS, 2000). With advising linked to the learning process, advisors benefit from student development theories to enhance the teaching aspect of advising. According to Appleby (2002):

> Well-delivered developmental advising helps students understand why they are required to take certain classes, why they should take their courses in a certain sequence…what knowledge and skills they can develop in each of their classes…and the connection between learning outcomes and of their department's curriculum and the knowledge and skills they will be required to demonstrate in graduate school and/or their future careers (p.134).

This study considers the link between advising and learning and examines how interdisciplinary learning may affect the advising impact on students.

C. ACADEMIC ADVISING AND INTERDISCIPLINARY STUDY

Much research on advising effectiveness exists, and much is written on how advising serves specific student groups, including the advisement of students in specific fields of study (such as engineering, the health professions, and the arts). There is very little known research, however, that specifically examines advising in interdisciplinary programs (M. A. Miller, personal communication, May 27, 2003). Educator and scholar of interdisciplinary study William H. Newell states that "The rationale...should be that advising is even more important in interdisciplinary programs since there are so many more decisions for students to make, yet the distinctive challenges of advising in an interdisciplinary context have only recently begun to be probed" (W. H. Newell, personal communication, July 8, 2003). Given the pedagogical and curricular differences between the disciplinary and interdisciplinary programs, their student advising needs are different.

Just one published reference to advising in interdisciplinary study was found for this study. In "Advising in Interdisciplinary Programs," Gordon (2002) applies principles of effective advising that *should* be offered to students in interdisciplinary study. She identifies specific characteristics of interdisciplinary study and ways in which advisors can guide students. What Gordon's writing does not include are data on the students' experiences with academic advising in interdisciplinary programs.

D. ASSESSMENT OF ADVISING

Given advising's impact on the quality of undergraduate education, it needs to be the focus of close examination and assessment (Light, 2004; Banta, Hansen, Black & Jackson, 2002). Advising assessment, however, has not been widespread (Lynch, 2000),

and the practice of assessment in general has not been practiced in higher education with the frequency that its advocates claim is needed for affecting educational quality (Ewell, 2002).

This study will contribute to the literature on advising assessment as it addresses the advising experiences of students in interdisciplinary study.

E. STATEMENT OF THE PROBLEM

According to Klein and Newell (1997), evaluation of interdisciplinary programs is needed, but little has been done in this area. Moreover, there is very little known research on the advising experiences of students in interdisciplinary programs. The assumption here is that interdisciplinary study needs to have specific advising practices and focus, which need to be identified empirically. The purpose of this study is to provide the empirical data that may describe the advising experience of interdisciplinary study. It will also seek any significant differences in experiences between students in interdisciplinary programs and students in non-interdisciplinary programs. For institutions that have both interdisciplinary and noninterdisciplinary programs, identifying these differences may help advisors better understand the demands of interdisciplinary study on advising.

F. THEORETICAL FRAMEWORK

This study bases its argument on a number of beliefs about serving undergraduate students and measuring that service's effectiveness. One belief is that advising, as a service to undergraduate students, needs to recognize and address the specific needs of the various types of students in order to have a positive impact on their education.

The undergraduate population in the U.S. has been getting increasingly diverse, with increasing enrollments of such groups as minority students, adult learners, and part-time students. In student services such as academic advising, student groups are more than just demographic profiles – they include students who have varying educational backgrounds and experiences, including those who are on probation, in transition, have disabilities, and other characteristics. The literature on academic advising provides studies that measure and explicate the needs of a broad range of student types (Banta, Hansen, Black & Jackson, 2002). Various advising models exist to accommodate these populations, such as advising models designed just for freshman students, and for student athletes, transfer students, and adult students. The field of academic advising recognizes that these groups have specific needs and that advising can provide specific service to these undergraduate populations (Grites, 1979). This theory, that advising can recognize and address the specific needs of certain student groups, provides a basis for this study.

Another belief that contributes to this framework is that the goals of advising are based on student needs that can be identified through the application of student development theories. The field of advising is informed by student development theories that provide models of cognitive, social, identity, ethical, and moral development (as discussed below in chapter two). The goals of advising typically include guiding students toward the development of suitable educational plans, clarification of career and life goals, development of decision-making skills, and reinforcement of student self-direction (CAS, 2000, pp. 417-418). A complete list of standards for academic advising goals has been published by the Council for the Advancement of Standards in Higher Education (CAS).

One classification of student needs is based on the curriculum (Lowenstein, 2000; Schein, et al., 2004). There are specific advising strategies for students studying in such fields as engineering, health professions, business administration, and the humanities. Students studying in each of these fields have specific and unique guidance. Students in interdisciplinary programs have unique educational experiences, and have different demands placed on them. Not only do these students need to be guided through their own curriculum, as are all other students, they need to understand the unique experience of interdisciplinary education. This model of curriculum-based advising contributes to the framework for this study.

This study examines the students' survey responses in order to determine the quality of their advising experiences. The use of measuring student feedback can lend itself to enhancing the undergraduate experience and to institutional quality assurance in general. Mortimer and Edwards (1990) observe the following in regard to making improvements in higher education:

> Quality cannot be increased by simply increasing admissions standards. We must begin to define quality in terms of student experiences. The problem is that prevalent views of excellence in higher education do not necessarily reflect what students actually learn from their college experiences (p. 77).

Perhaps the most direct method of understanding the experiences of students is to ask them about it. One method of measuring the quality of advising service and student expectations is the use of a survey. Surveying is often used to measure the quality of specific aspects of student life. Survey data analysis can be used by the university to support proposals for quality improvement. By asking students about their experiences,

what they find to be important, and how satisfied they are, practices can be adjusted (Upcraft & Schuh, 2002).

G. SIGNIFICANCE OF THE STUDY

Klein and Newell (1997) offer strategies for promoting the integrating of interdisciplinary study in the undergraduate curriculum. Their twelve strategies address the design of courses, pedagogy, and community-building, but does not include the guidance, or advisement, of students. This study is designed to expand the understanding of advising of students in these programs. With this information, it may be possible to design more effective advising models within interdisciplinary programs. With the rise in popularity of interdisciplinary study, the demand for, and interest in, effective advising should be given increasing attention. Studying this topic now is timely, given what is known about the effectiveness of advising in interdisciplinary programs. The findings of this study would add to the current literature in both interdisciplinary education and academic advising.

These findings will inform advisors and administrators of the interdisciplinary programs at the university being studied, and at institutions with advising in interdisciplinary study similarly organized according to traditional disciplinary departments. The findings may be useful to those who are concerned about meeting the specific advising needs of interdisciplinary students, and who are in a position to provide better support for student success, retention, and satisfaction. It would also contribute to the knowledge base of undergraduate academic advising, providing information about the impact of advising on this specific group of students.

In addition to identifying student perceptions of advising, a greater understanding of student advising in general may enhance our understanding of how the students experience interdisciplinary pedagogy and curriculum, possibly pointing to new directions for study.

H. INSTITUTIONAL CONTEXT

At the university from which this study's data were collected, interdisciplinary study is distributed across several colleges. It has no formal structure, such as a department of "integrative studies," as found at some institutions. Resources, such as academic advising, do not exist uniformly for each interdisciplinary program. With an unstructured and decentralized administration of undergraduate interdisciplinary study, students' individual experiences may vary significantly. Moreover, the university has not made a systematic examination of the student experience in interdisciplinary study, in particular, advising. It is possible that interdisciplinary students' needs or expectations are not being acknowledged, since there is no specific shared advising models and no university-wide examination of advising experiences.

The literature on interdisciplinary study shows that interdisciplinary advising can take place in two types of institutional settings. One type of setting is organized mostly by academic departments following the model of traditional disciplines (such as the university at which this study is conducted). The advising of students is typically organized by one department and/or discipline. In this setting, interdisciplinary programs are typically combinations of disciplines or majors with advising still being provided by one advisor trained in one discipline (Gordon, 2002). The other setting is in an institution

which is interdisciplinary by design and has organized its advising system specifically for the interdisciplinary nature of its programs. Experimental colleges such as Hampshire College, has made interdisciplinary education its hallmark since its founding in 1970. Hampshire has an advising system that caters to interdisciplinary study, i.e. it provides students with faculty advising committees with faculty representing different disciplines (McNeal & Weaver, 2001).

The distinction between these two settings is important for this study because of a key assumption. Interdisciplinary programs within institutions organized primarily by traditional disciplinary departments may not necessarily have an advising program specifically suited for interdisciplinary study. Interdisciplinary advising may still be modeled after the disciplinary departments; i.e. in which departments have advisors who may have a limited, or single-discipline perspective on the curricular and pedagogical demands on the students.

I. RESEARCH QUESTIONS

The following six research questions guide this study. Each question is answered by data gathered by the university's student survey. Therefore certain survey questions will correspond to these research questions. All questions refer to students' "primary" academic advisor (defined below in the subsection *Definitions*).

1. Research question one

How often do students in interdisciplinary programs and those in disciplinary programs make contact with their primary academic advisors? Does the frequency of

visits by the students in interdisciplinary programs differ significantly from the frequency of students in noninterdisciplinary programs? To answer these questions, data from the following student survey item will be used: “About how many times did you visit your academic advisor this past year?”

The rationale for this research question is that contact with one’s advisor constitutes engagement with the advising process. Previous studies of advising assessment includes measuring the frequency of student-advisor contact (Habley, 2004).

2. Research question two

What are the most frequent reasons for students in interdisciplinary study to be in contact with their primary advisor(s), i.e. what is the content, or subject matter, as determined by students? How does this compare to students to noninterdisciplinary study? To answer these questions, data from the following student survey item will be used: “How often have you seen an academic advisor this year for each of the following reasons?”

The rationale for this research question is that advising content describes engagement with the advising process. i.e. it may be used to describe how students use advisors, and how students understand the role of advising. Previous studies of advising assessment includes using content items as variables (Reinarz & Ehrlich, 2002).

3. Research question three

What competencies of their primary advisor (i.e. advisor availability, practices and knowledge) are most important to students in interdisciplinary programs? How

satisfied are students with their advisors regarding these competencies? How does this compare to the students in noninterdisciplinary programs? To answer these questions, data from the following student survey item will be used: “Rate the importance of these practices of your primary academic advisor, and rate your satisfaction with these practices.”

The rationale for this research question is that advisor availability and knowledge are characteristics of effective advising (Creamer & Scott, 2000). Measuring student perceptions of importance and satisfaction are typical variables for assessment (Hanson & Raney, 1993; Lynch, 2000; Creamer & Scott).

4. Research question four

What personal characteristics of their primary advisor (e.g., approachability, taking personal interest in students, assisting with long-term educational plans) are most important to students in interdisciplinary programs? How satisfied are students with each of these characteristics? How does this compare to students in noninterdisciplinary programs? To answer these questions, data from the following student survey item will be used: “Rate the importance of these characteristics of your primary academic advisor, and rate your satisfaction with these characteristics.”

The rationale for this research question is related to Research Question Three: that advisor helpfulness and approachability are characteristics of effective advising (Creamer & Scott, 2000). Student perceptions of importance and satisfaction are typical variables for assessment (Lynch, 2000; Creamer & Scott).

5. Research question five

Aside from their primary academic advisor, to what other sources do students in interdisciplinary programs go for advising? How does this compare students in noninterdisciplinary programs? To answer these questions, data from the following student survey item will be used: “Students often receive advice from more than one source. How often did you seek guidance from each of these sources this year?”

The rationale for this research question is that sources of advising describe the level of engagement with the advising process. Previous reports of advising assessment includes using advising sources as variables (Hanson & Raney, 1993; Reinarz & Ehrlich, 2002).

6. Research question six

What is the overall satisfaction of the advising experience of students in interdisciplinary programs and how does that compare to students in noninterdisciplinary programs? To answer this question, data from the following student survey item will be used: “How would you describe the overall quality of this year’s academic advising experience?”

The rationale for this research question is that the quality of the advising experience may affect the level of engagement students have with the advising process.

J. ASSUMPTIONS OF THE STUDY

The following are assumptions made concerning this study:

1. The educational experience of interdisciplinary programs has differences from the experience of programs in noninterdisciplinary programs. From this, it is assumed that the academic advising in interdisciplinary programs is different from advising in disciplinary programs.

2. The students' responses to the survey items were honest and representative of their perceptions of their undergraduate experience.

3. Results yielded from data analysis are generalizable to the population of undergraduate students in interdisciplinary study at this university.

K. LIMITATIONS

The following are limitations of this study.

1. This study is a secondary analysis of survey data gathered at one time by an academic advising committee at a mid-sized private research university.

2. The survey used by the university was designed by a team of faculty and staff advisors appointed by the university as a means to conduct institutional quality assurance in academic advising. This researcher was one of the participants in the survey design.

3. Since the structure of interdisciplinary programs (and their academic advising models) can vary between institutions, the generalizability of this study to other institutions is limited.

4. Students were asked to answer the survey items in regard only to their primary academic advisor.

L. DELIMITATIONS

1. This study is confined to a subset of items on the university's advising survey. These chosen items ask students about their programs of study, their frequency of contact with advisors, the content of their advising meetings, and their satisfaction with, and ranking of importance of, certain advising characteristics. These items are covered in seven survey questions out of a total of twelve questions.

2. This study uses data from a single methodological source (the student survey), limiting the examination of advising by a single research outcome—student perception of the advising experience.

3. The university at which this study's data was gathered will not be identified. This has been decided in order to protect the identity of advisors in the academic programs referred to in the study.

M. DEFINITION OF TERMS

The following terms, with their operational definitions, are used throughout this study.

Academic Advising

Academic advising is generally regarded as a complex and multifaceted service providing guidance to students. Advising is provided by a designated person, either a faculty member or a staff professional, who is assigned to guide students toward completion of their educational goals. One fairly encompassing example of a

comprehensive definition of advising is from the Academic Advising Task Force of the University of Arizona (2001):

> Academic advising is a collaborative relationship between a student and an academic advisor. The intent of this collaboration is to assist the student in the development of meaningful educational goals that are consistent with personal interests, values and abilities. Although many individuals on campus, including academic advisors, may assist the student in making decisions and accomplishing goals, the academic advisor is granted formal authority by an academic unit (e.g. college, school, department) to approve the student's academic program of study and assist the student in progressing toward the appropriate degree (p. 2).

Primary Academic Advisor

Survey respondents were instructed to answer questions in regard to their primary academic advisor. For this study, a student's primary advisor is defined as their specific academic program's advisor assigned to advise students majoring in that program. It does not include the advisors of secondary majors or minors.

Academic Disciplines

The disciplines, as defined by Lattuca (2001), can be defined as "sets of problems, methods, and research practices or as bodies of knowledge that are unified by any of these," or as "social networks of individuals interested in related problems or ideas" (p. 23). At institutions of higher education, the disciplines are typically organized into formal academic departments.

Interdisciplinary Study

While many definitions exist for interdisciplinary study (Klein, 1990), in this study the term refers to the use of more than one discipline in pursuing a particular area of study. Klein and Newell (1997) define interdisciplinary study as

> ...a process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline or profession...[it] draws on disciplinary perspectives and integrates their insights through construction of a more comprehensive perspective (pp. 393-394).

Interdisciplinary Programs

These academic programs offer undergraduate majors that are defined by the university as interdisciplinary. The university at which this study takes place defines interdisciplinary study broadly as working outside "departmental lines" and "beyond just one discipline." The following is the list of the institution's undergraduate programs represented by the survey respondents: Anthropology and History; Biological Sciences and Psychology; Computational Biology; Ethics, History and Public Policy; History and Policy; Information Systems; Policy and Management; Social and Cultural History; Social and Cultural History. Programs with multiple college affiliations: Humanities and Arts, Sciences and Arts.

Noninterdisciplinary Programs

These academic programs offer undergraduate majors that are not defined by the institution as interdisciplinary. The following is the list of the institution's programs

represented by the survey respondents: from the College of Fine Arts: Architecture, Art, Communication Design, Drama, Industrial Design, and Music. From the Humanities and Social Sciences college: Cognitive Science, Creative Writing, Decision Science, Economics, English, French, Japanese, Managerial Economics, Philosophy, Political Science, Professional Writing, Psychology, Russian Studies, Spanish, and Statistics. From the College of Sciences: Biological Sciences, Chemistry, Mathematical Sciences, and Physics. From the School of Business: Business Administration. From the School of Computer Sciences: Computer Science. From the School of Engineering: Chemical Engineering, Civil Engineering, Electrical & Computer Engineering, Materials Science & Engineering, and Mechanical Engineering.

N. OVERVIEW OF THE STUDY

Interdisciplinary study is a prevailing feature of undergraduate education. Students experience it in many forms, through specific courses, curricula, residential learning communities, research, and experiential education (such as internships and study abroad) (Klein, 1996; Newell, 2001). Students who pursue an academic major that is interdisciplinary face different, and more complex, learning challenges than students who study in the more traditional disciplinary programs. These differences are based upon the nature of interdisciplinarity, i.e. examination of phenomena from multiple perspectives and methods and the need to integrate or synthesize these perspectives into new modes of inquiry and problem-solving. The type of guidance these students demand from their advisor may be different from what other students experience. An examination of this institution’s advising survey data may reveal characteristics of these differences.

II. REVIEW OF RELATED RESEARCH AND LITERATURE

This review of literature establishes a relationship between this study and the previous work published on interdisciplinary study and academic advising. Three areas are reviewed. The first area affirms academic advising's role in undergraduate education and its relationship to student success and satisfaction. The second area delineates the specific nature of interdisciplinary study compared to disciplinary study. The chapter concludes with an examination of previous studies of students' experiences with advising, both in terms of student engagement, needs, and satisfaction with advising.

A. INTERDISCIPLINARY EDUCATION

1. Historical overview

An appropriate starting point for examining interdisciplinarity's place in higher education is to understand the nature of the academic discipline. In their present form, the disciplines are a result of a relatively recent development in higher education. They have provided the rationale for what is now considered the traditional departmental structure of U.S. colleges and universities. Between 1875 and 1910 a "disciplining of the curriculum" occurred as higher education shifted from a model of a single sequence of study to one that had up to twenty or more disciplines – each with its own department, major, and courses (Klein, 1999). The effects of this specialization remain strong to this day, visible from "the organization of research and curriculum to criteria of excellence in the

decisions of editorial boards, funding agencies, and tenure/promotion committees." (Klein, 1996, p. 6).

The beginnings of interdisciplinary study in the U.S. can be traced back to the formation of experimental colleges back in the late 19th century. Klein (2001) points to the mid-1920s as the birth of interdisciplinarity, when the term was used in a scholarly publication. In the 1920s and 30s, institutions such as Bard College, Bennington College, Hampshire College, and Antioch College, were sites of experimentation in undergraduate education. These schools offered alternatives to the traditional college and university, such as living-learning communities, experiential learning, and interdisciplinary study. Hampshire College, for example, has no academic departments based upon the traditional disciplines (McNeal & Weaver, 2001).

In the 1950s and 1960s, fields of interdisciplinary study began to emerge in response to the growing demands of social and technical problems. Describing this era as a "knowledge explosion," Klein (1999) lists the interdisciplinary areas of study to include International Studies, Urban Studies, Policy Studies, and Ethnic Studies. These areas presented new ways of thinking and new forms of scholarship—a type of "relational pluralism" that worked to break down barriers between disciplines and encourage the exploration of unifying themes, concepts and forms—ways to make connections between the disciplines.

Newell (1996) describes the 1960s and early 1970s as a watershed area for interdisciplinarity with new demands for interdisciplinary study. A student survey conducted by the Organization for Economic Cooperation and Development (OECD) in the 1960s expressed a student protest against departmental organization, the

"parcelization and artificial divisions of reality" (Klein, 1996, p. 20). Such findings stimulated innovation in the curriculum.

In his research that counted the number of interdisciplinary programs in the U.S., Edwards (1996) found various forms of interdisciplinarity in three major areas of undergraduate education: in disciplines, interdisciplinary fields, and general education. Edwards concluded that "Interdisciplinary studies are not only alive and well, but are also growing and evolving in new and exciting directions." Newell described its growth as "moving from the radical fringe to the liberal mainstream" (in Klein, 1999; p. 2) and Klein declared that interdisciplinary studies "have come of age" (1999, p. 2).

With interdisciplinary study firmly positioned in undergraduate education, it should be subject to the assessment of its contribution to student learning and to understanding of how it is experienced by students. As this study asserts, the advising, or guidance, of students contributes to this understanding.

2. Interdisciplinary learning

Lattuca (2001) states that the concept of disciplinarity is powerful, and that knowledge specialties are "fundaments on which all else is constructed." The emerging presence of interdisciplinarity challenges this conception, according to Klein (1999), who writes that "knowledge as a foundation, a linear structure, has been replaced by images of a network, a web, a dynamic system" (p. 1). The model of depth and specialization is being replaced by images of disciplinary boundary crossing and cross-fertilization (p. 3). The ideas of the academic major and the disciplinary department are changing; the metaphor shifts from the department as a "silo" that stores knowledge to a matrix of

connections and collaborations (p. 4). Reasons for this change include the productive borrowing of tools, methods, concepts, and theories from one area to another.

Previous studies that have explored the nature of interdisciplinarity have treated its characteristic of disciplinary boundary crossing "as an anomaly, a peripheral event, or in a developmental stage (Klein, 1996, p. 2). Now "boundary work and boundary crossing are as central to the production of an organization of knowledge as boundary formation and maintenance" (p. 2).

Klein and Newell (1997) observe that the rise of interdisciplinary study is forcing organizational change on campuses. Conceptually, they apply the metaphor of systems theory, describing institutions to be shifting from a simple organizational system to one of greater complexity. Interdisciplinary activities are taking up increasing amounts of faculty time, making more complex both the institutional structure and knowledge taxonomy (Klein, 1996, p. 20). Student demand, existing for decades now, continue to seek alternatives to the disciplines. "Far ahead of faculty with their views, many students do not hold sacred the disciplinary boundaries and want to combine fields such as design, computer science, business, and area studies" (Ferren, quoted in Klein, 1999, p. 10).

Klein (1996) divides the applications of interdisciplinarity into four intellectual activities: for critique, for problem-solving, for building bridges, and for achieving unity of knowledge (pp. 10-15). She adds that the demands for problem-solving and dealing with complexity are stronger warrants for interdisciplinary study than is the demand for unity of knowledge (p. 34). Newell (in Klein, 1996) writes that, in research, problem-solving is paramount, and for use in the curriculum, the interdisciplinary approach encourages development of problem posing and problem solving which cultivates an

"integrative habit of mind" (p. 213). Students gain confidence when they apply, evaluate, abstract, generalize, conceptualize (Klein, p. 214). Departments, Klein claims, fail to develop the integrative skills students need for dealing with complex problems and issues (p. 233).

Interdisciplinary study has had an impact on teaching. With the emphasis on problem-posing and problem-solving, undergraduate pedagogy now becomes "intentional." Klein (1999) writes that "The shift is indicated by the move from images of production, prescription, control, performance, mastery, and expertise to images of dialogue, process, inquiry, transformation, interaction, construction, and negotiation" (p. ?) With the emphasis on the learning process, the metaphor of teaching shifts from telling to mentoring – from instructors being the "sage on the stage" to the "guide on the side."

Although interdisciplinary study has "come of age," the administrative establishing of interdisciplinary programs appears difficult. Newell and Green write:

> The term 'interdisciplinary studies' itself is so loosely and so inconsistently used that almost any course which does not fit neatly within disciplinary departments is apt to be labeled 'interdisciplinary.' Second, the liberal arts objectives of interdisciplinary studies are vague at best; even where practitioners can agree on what they mean by the term, it is unclear what they are trying to accomplish. Third, there are no widely accepted canons of interdisciplinary scholarship by which to judge excellence. Finally, it is not certain what the appropriate relationship is between interdisciplinary study and the academic disciplines themselves (Newell, 1996, p. 24).

In the literature on interdisciplinary education, there is sparse reference to advising students, and no research found on advising models or on advising effectiveness. As referenced in Chapter 1, the most attention given to advising in print is Gordon's essay *Academic Advising in Interdisciplinary Programs* (2002). This essay is mostly prescriptive, applying general principles of advising to the interdisciplinary context. Since interdisciplinary learning involves drawing insights from multiple perspectives on complex issues and integrating them into more comprehensive understanding, Gordon writes that advisors need to understand students' cognitive development:

> Knowledge of student development theory can provide a framework for understanding not only how students learn, but how ready an individual student might be for an interdisciplinary experience. This knowledge includes an understanding of student competencies to handle the academic content and their intellectual abilities to analyze and integrate diverse and possibly conflicting bits of information (2002, p. 245).

Gordon believes advisors need to be able to help students become aware of their intellectual growth and help them monitor the progress in their development.

B. ACADEMIC ADVISING

This section examines the research that supports the assertion that academic advising makes a positive impact on undergraduate education, and that its assessment is critical to the quality undergraduate experience.

Over the past three decades students, faculty members, and administrators in higher education have given academic advising increasing recognition and value as a

contributing factor in college student success. The literature has many examples of studies reporting how the quality of advising impacts students in regard to retention, academic and social integration, decision-making processes in selecting academic programs and careers, overall student satisfaction, and success (Banta, Hansen, Black & Jackson, 2002; Cuseo, 2004, Hunter & White, 2004).

1. Historical overview

The delivery and content of guidance for students have evolved in relation to the changes in higher education and student demographics. From colonial times to the late 19th century, faculty advising focused generally on the academic and moral development of the individual (and not on the needs of society), though the relationship was impersonal. The formal role of the advisor was identified in the American university system around the turn of the century, when the course elective system of the curriculum became a defining characteristic in higher education. At that time, what was taught in college had expanded beyond the mastery of one person, and no longer were all educated persons required to know the same body of knowledge. The elective system provided students with choice about their courses of study, and provided a foundation on which the academic departments and research specialization were built. In effect, the advising system primarily was to provide answers to students' questions about scheduling options and registering for classes.

At around the same time, the focus of faculty members tended to shift from concern about student academic and moral development to individual research (Fenske, as cited in Daller, 1997). The elective system, combined with the development of academic departments, research-oriented graduate schools, and reward systems tied to

research efforts, altered the values of faculty. The relationship between students and faculty changed, since faculty had "decade by decade narrowed their definition of the students until all that was left was their minds" (Rudolph, as cited in Daller, p. 16).

Another significant change in the advising model occurred after World War II, with enrollments in higher education increasing, due to such factors as G.I. Bill funding and expanding opportunities for access to colleges and universities. The influx of students led to changes in academic advising, since many faculty, especially at research universities, no longer had the time or incentive to advise or even to teach. This weakened formal faculty advising systems, and advising became a function of student affairs administration on many campuses, or it was placed second to teaching on campuses that employed a faculty advising system (Grites, 1979).

In the 1960s, the public became increasingly interested in individuals' access to higher education and in shaping educational goals and tasks in order to find solutions to immediate problems than in learning the disciplines in traditional research methods (Klein, 1996; Frost, 2000). National goals for higher education administration addressed social injustices and expanded access, resulting in increased minority enrollments and financial aid programs. Institutional input variables, such as admission demographics and enrollment, were emphasized over output, such as graduation rates and job placement (Gaither, Nedwek, & Neal, 1994). By the late 1960s, American higher education grew at its highest rate in three decades and faced pressures that would change the way students were served, in particular in the way they were advised (Gaither, Nedwek, & Neal). High enrollment amplified the need for student guidance. As described in the following

section, these changes led educators to begin to apply theories of student development to advising in order to address these needs (Ender, Winston, and Miller, 1984).

Academic advising received renewed attention in the late 1970s and into the 1980s for different reasons. It became part of a strategy to combat declining enrollments and alarming attrition rates (Daller, 1997). Moreover, in the 1980s a strong public debate arose about the "quality" of service in both the private sector of the economy and in higher education. The emphasis on input variables gave way to an emphasis on output and the quality of college graduates (Gaither, Nedwek, & Neal, 1994). Advising was seen as not just a service to reduce student attrition, but as a way to add quality to undergraduate education (Light, 2001).

By the 1990s, academic advising models became more formalized on most campuses as a response to several forces: a renewed increase in student enrollments and student diversity, faculties that continued to increase attention to research (thereby requiring more non-faculty models of advising), and the growth of the field of advising as a profession, which has established a widespread community of practitioners and researchers in the field (Habley & Morales, 1998; Frost, 2000).

2. Theories of academic advising

This subsection reviews the foundations of student development theories and their relation to advising. These theories, which identify stages of student maturity relevant to advising, have had a lasting influence on the way advising is modeled and practiced.

Historically, academic advising has been characterized mainly as prescriptive and authoritative, with the advisor telling the student what courses to take. The attention and reflection given to academic advising in the late 1960s and early 1970s brought forth new

approaches to supporting students and resulted in an evolution in advising practices. Two articles published in 1972 made a significant impact on the field of advising, and remain recognized today as seminal works. Working independently of each other, the articles' authors, Crookston and O'Banion, advanced two major concepts: linking advising to teaching, and applying student development models to advising. Their writing led to the formation of what is called developmental advising, a model that has been written about and debated over the past three decades.

Crookston's (1994) contribution rests on several key assumptions: that higher learning is to be viewed as an opportunity for the developing individual to achieve a self-fulfilling life (i.e. to develop a life plan), and "…that teaching includes any experience in the learning community in which the teacher and student interact that contributes to individual, group, or community growth and development and can be evaluated" (p. 5). Since academic advisors are in a position to intersect with students in the learning community, Crookston views advising as a teaching function.

O'Banion's (1994) contribution is seeing advising as an intentional process which should include career and life goal counseling, with advisors working with students to explore life goals, vocational goals, program choice, course choice, and scheduling courses. He proposes a developmental model based on a logical sequence of these very steps to be followed in the process of academic advising.

The student development approach to academic advising has received great acceptance in the field of advising as a highly effective advising model since it is student-centered and values the idea that individual students are unique in the personal attributes they bring to the educational experience (Winston, R. B., Miller, T. K., Ender, S. C.,

Grites, T. J. and Associates (Eds.), 1984). The notion of educating the whole student is a perspective that guides many theories of student development. General knowledge of how students progress in their personal and cognitive growth can provide insights into the needs of individual students (Gordon, 2002).

The foundation of the developmental concept comes from the literature and research in psychology. Piaget's model of childhood development from the 1920s was rediscovered in the 1950s and prompted new studies of human development (Hemwall & Trachte, 1999). He theorized that humans develop in a systematic way by predictable "stages," and that humans integrate new information into current ways of thinking. In the 1950s, Erikson presented a comprehensive model of psychosocial development, which described age-linked developmental "crises" in which a particular task is addressed by the individual and is resolved. An example is the issue of personal identity and role confusion facing traditional-age college students (Carter & McClellan, 2000).

Such developmental theories can be categorized in various ways that relate to academic advising. Most relevant are theories that address students' cognitive and psychosocial development. Cognitive development theories describe development as a series of irreversible and hierarchical stages and processes by which the individual perceives and reasons about the world. These stages contribute to cognitive complexity, a goal of developmental educators, which provides individuals with more adequate interpretation of experiences and events (Creamer & Creamer, 1994). Psychosocial theories also emphasize personal development, but through a series of life stages that occur in chronological sequence throughout various cycles in life. Students combine their thinking, feeling, and experiences to satisfactorily resolve complex, or developmental,

tasks. Successful resolution of these tasks, or life themes such as searching for identity and purpose, promotes growth and enables students to move on to more complex tasks (Chickering, 1969).

According to Creamer (2000), Chickering's theoretical framework for psychosocial development is perhaps the best known and most widely used theory in explaining college student identity development. Chickering relates developmental tasks to an individual's years in college, describing seven developmental tasks, or "vectors," that need to be completed if students are to move effectively into adulthood. These seven are: achieving competence, managing emotions, becoming autonomous, freeing relationships, establishing identity, clarifying purpose, and developing integrity (Chickering, 1969).

Writing about guiding students through interdisciplinary programs, Gordon (2002) interprets Chickering's model:

> These developmental tasks are continually being mastered throughout life, and Chickering describes a differentiation and integration process within each task in which students move through cycles of ever-increasing levels of complexity. Although it may appear that these tasks have been resolved, circumstances may require a need to revisit them later. Each student thus follows a unique path and timeline in personally accomplishing these tasks. (p. 246)

Gordon links three of Chickering's vectors directly to the process of developmental advising—helping students to develop competence, autonomy, and purpose. Chickering (1994) himself identifies his work with advising, and he strongly

agrees with O'Banion's developmental approach:

> My position here is that the fundamental purpose of academic advising is to help students become effective agents for their lifelong learning and personal development. Our relationships with students—the questions we raise, the perspectives we share, the resources we suggest, the short-term decisions and long-range plans we help them think through—all should aim to increase their capacity to take charge of their own existence (p. 50).

By the 1980s, the idea of developmental advising had become a dominant paradigm in the literature of the field. (Winston, Miller, Ender, Grites, & Associates (Eds.), 1984). The influence of O'Banion and Crookston is most evident in the amount of attention given to student development theory in the advising literature.

This paper's study uses data from a survey that has taken into consideration the developmental aspects of advising. The survey asked students about their reasons for meeting with their advisors, such as for discussing extracurricular experiences, study skills, and personal advice.

While the developmental advising model has had significant impact on the field of advising, its validity has remained debatable by some. The following section reviews highlights of that debate.

3. Critical reflection on developmental advising

Reviewing portions of the debate about developmental advising can reveal evolving beliefs about the role of advising in a student's education.

Miller & Alberts (1994) find problems of applying student development theory to practice. “For too long student development has been overwhelmed by an abundance of theory that seldom makes its way into usable form” (p. 43). They cite several constraints for faculty implementing developmental advising, such as needing to be knowledgeable of developmental model, and working with limited institutional support. Faculty face the need to master two bodies of knowledge—their own discipline and the art and science of teaching adults. “Too few of us work with institutional support that affords us the time to read even current research,” they write (p. 43).

Laff (1994) also addressed the difficulty of applying developmental theory, stating that there is hardly one kind of developmental theory since human development is very complex. Students deal simultaneously with different kinds of developmental tasks, and at different levels. Moreover, he says, developmental theories are descriptive and define stages, or positions, that define cross-sections. What is not delineated, he asserts, is transition—the ongoing developmental movement from one stage to another. Laff, along with Creamer and Creamer (1994) acknowledge that if developmental advising purports to teach, then it needs to teach students the skills to deal with transitional processes.

In the years since the Crookston model was presented, Laff (1994) observes, the delivery of advice to students by advisors has been consistent, but this is not a developmental advising task. By some assessment measures, overall advising outcomes seem not to have improved. He cites a 1993 report by Habley that points out that there has been no overall improvement in advising, and he quotes Boyer’s (1987) statement that advising “is the weakest link in the undergraduate experience” (p. 47).

4. Alternatives to developmental advising

In addition to what some find to be the problematic nature of applying and practicing developmental advising, others find it problematic to be such an influential model. The developmental model is seen as a paradigm, and one that has been dominant to the point of leading academic advising away from its role in undergraduate education.

Recent critiques of the developmental model within the student affairs field argue that the theory and movement has separated student affairs from intellectual life and has become one of the current problems in undergraduate education. Hemwall and Trachte (1999) argue that the student development movement has consumed the process of academic advising and that this movement, and "has lost sight of the central mission of higher education" (p 6). They find that much writing has consigned academic or cognitive growth to a position equal to affective and other forms of growth, or commonly de-emphasized or ignored academic learning (p. 6).

Hemwall and Trachte (1999) challenge the developmental model and propose an alternative that they call the "praxis" model (p. 8). This alternative model of advising puts student learning as the central organizing concept, aligning more closely with the "student learning" model of the 1990s. This model, or "learning paradigm," shifts the focus of instruction from the teacher to the learner, asking "what has the student learned?" rather than "what was the topic of instruction?" The starting point of the model is to define student "praxis" learning goals, as drawn from the curriculum and the institution's mission and purpose. If academic advising is learning-centered, it "requires a focus on both the curriculum and pedagogy" (Hemwall & Trachte, p. 7). The foundation of pedagogy in this context is in the engagement of students through dialogue—guiding,

discussing social context, and expressing, justifying, and discussing ideas. For Hemwall and Trachte, advisors are a key connection point between the curriculum and the institution's mission and the student. They ask "when and where do students find out about the purpose(s) of the curriculum? Advising addresses both the 'what' and the 'how'" about learning (1999, p. 8).

Grites and Gordon (2000) respond to Hemwall and Trachte's criticism of developmental advising, stating that personal development is merely one aspect of developmental advising. Advocates of developmental advising seek to integrate educational, career, and personal goals. "Academic goals, decisions, and learning cannot be isolated from students' career goals and aspirations, nor from their social characteristics and environments" (p. 13). They write that there is no singular focus in the developmental model.

What the praxis model describes and offers to advisors and students, according to Grites and Gordon (2000), is exactly what developmental advising has been suggesting for years—that is, helping students to understand the purpose and meaning of course requirements, talking about values, and relating them to the curriculum.

Grites and Gordon agree with Hemwall and Trachte that academic advising needs to be based on more than one theoretical framework. "Attempts in the past to create one 'theory of academic advising' have not been successful…knowledge of many theories, such as learning, personality, moral, career, cognitive, narrative, and minority development, can and do enrich the practice of academic advising" (p. 13). They add that it is rare for any advisor to use only a single concept in practice, and that advising can and should integrate many theories, frameworks, and concepts into its practice. (p. 13).

With substantial discourse focused on the developmental model, how much of an impact has it had? One measure shows that, despite the large volume of attention in print, it is not in wide use. ACT's (formerly American College Testing) Fifth National Survey of Academic Advising in 1997 had 754 institutional respondents indicating that 75% used advising models in which faculty had primary advising responsibility. Yet, only about a third provided any formal training for their faculty advisers; and where training was done, the "counseling" or developmental content was a minor topic. The majority of topics included were of an "academically centered" nature: academic regulations, policies, registration procedures, use of test results, transcripts, degree audits, and campus referral sources. The developmental advising paradigm may indeed be theoretically dominant, but it does not appear to have penetrated advising practice as a dominant reality (Habley, 1997).

The survey used for this paper's study not only considered the student development aspects of advising, but also knowledge of the curriculum. As sources have claimed (above), there is no single prevailing concept or model of academic advising.

5. The impact of academic advising

This section examines the research on the impact of academic advising on the undergraduate experience. Research data show that undergraduate advisors are in a position to influence students in many ways.

Researchers of higher education who have examined undergraduate education, such as Chickering (1994) and Astin (1977), have asserted that one of the most significant factors affecting student success is the quality of their association with a responsible, mature adult person in the institution (King, 1984). Perry emphasizes that

"the advisor occupies the critical space between students and the institution" (cited in King, 1984, p. 358). Based on his interviews with undergraduates at Harvard College, Light (2001) asserts that at critical points in the students' college careers, advisors posed questions or challenges that "forced [students] to think about the relationship of their academic work to their personal lives" (p. 88). He concluded that advisors can affect students in a "profound and continuing way" (p. 84). Indeed, on many campuses the only assigned and sustained one-to-one relationship a student has with an adult is the one with an academic advisor, as educators Hunter and White explain: "Academic advising, well developed and appropriately assessed, is perhaps the only structured campus endeavor that can guarantee students sustained interaction with a caring and concerned adult who can help them shape a meaningful learning experience for themselves" (p. 21).

Banta, Hansen, Black, and Jackson (2002) identify areas in which advising has been found to be related to student success and satisfaction. These areas are: the transition to college life, academic and social integration, adjustment and need satisfaction during the first year, decision-making processes in selecting the appropriate academic programs and careers, achievement of maximum potential, and academic success and retention (p. 6).

Cuseo (2004) writes that, although a direct, causal connection between advising and student retention has yet to be established, a strong case can be made that academic advising exerts a significant impact on student retention through its positive association with, and mediation of, variables that are strongly correlated with student persistence, namely: student satisfaction with the college experience, effective educational and career

planning and decision making, student utilization of campus support services, student-faculty contact outside the classroom, and student mentoring.

Tinto's research (1993) includes a focus on the reasons students drop out of college. He theorizes that students arrive at college with expectations that are subject to change during their enrollment. Students are likely to stay enrolled when their experiences and expectations are aligned with the normative culture on campus and when their interactions with others are positive. Students for whom this is not the case are more likely to drop out. Cuseo (2004) reasons that student retention appears to represent a student outcome that can be improved by advising since it is influenced as much by institutional behavior, such as advising, as it is by student characteristics (such as motivation or preparedness).

Advising is identified by others as one aspect of institutional behavior that is relevant to student retention. Wyckoff (cited in Cuseo, 2004) notes that "To establish a high degree of commitment to the academic advising process, university and college administrators must become cognizant not only of the educational value of advising but of the role advising plays in the retention of students" (n.p.). Noel (cited in Cuseo, 2004) reports "In our extensive work on campuses over the years, [we] have found that institutions where significant improvement in retention rates has been made, almost without exception, give extra attention to careful life planning and to academic advising" (n.p.).

Another way advising can make a positive impact on student retention and satisfaction is with the decision-making processes in selecting the appropriate academic programs and careers (McCalla-Wriggins, 2000). Retention research suggests that

student commitment to educational and career goals is one of the strongest factors associated with student persistence to degree completion (Wyckoff, cited in Cuseo, 2004). Advising is in a position to make an impact upon student planning and decision-making (O'Banion, 1994). The need for student support in these processes is backed by research that finds that student uncertainty and the tendency to change educational plans has been reported at all types of institutions (Cuseo, 2004). Such findings suggest that many students' final decisions about majors and careers do not necessarily occur before entering college, but during the college experience (Tinto, 1993).

The relationship between educational decision-making and retention is empirically documented by Astin (cited in Cuseo, 2004), who states that prolonged indecision about an academic major and career goals is correlated with student attrition. Cuseo (2004) finds "lack of certainty about a major and/or career" to be the number one reason cited by high-ability students for their decision to drop out of college (n.p.).

Trained academic advisors are well-suited for, and in a position to, help students with career-related decisions (McCalla-Wriggins, 2000). This type of advisement plays a vital role in retention. As Tinto (1993) states

> It is part of the educational mandate of institutions of higher education to assist maturing youth in coming to grips with the important question of adult careers…When plans remain unformulated over extended periods of time, students are more likely to depart without completing their degree programs (p. 41).

Another factor relating advising to student retention and success is the student-faculty contact outside the classroom. Many advising delivery models use faculty

advisors (Habley, 2004). When students have a chance to meet with faculty in this way, they have a chance to see them less as authoritative experts than as role models as learners and community members embodying the values and ethics of their fields of study. Supporting evidence that student-faculty contact is good practice comes from a broad base of research. The major contributors to the study of college impact (and cited above) all provide empirical documentation of this assertion (Tinto, 1993; Astin, 1993; Pascarella & Terenzini, 1991). Astin captures the point by reporting that "Student faculty interaction has a stronger relationship to student satisfaction with the college than any other variable [and] and any student characteristic or institutional characteristic" (p. 223).

6. Measuring advising quality

When an advisor is in place to assist students, they have the potential not only to affect retention, they can affect satisfaction. Yet research on student satisfaction with the quality of academic advisement in higher education over the years reveals a pattern of low levels of satisfaction. Ender, Winston and Miller (1984) conclude that "The greatest difficulty students cite with the quality of their academic experiences is advising" (p. 14). Astin (1993) reports the results of a national survey in which advising ranked twenty-fifth among the twenty-seven different types of types of services evaluated by students, with only forty percent of the surveyed students indicating that they were either "satisfied" or "very satisfied" with the quality of academic advising they received at their college. Despite this prevalent dissatisfaction with advising, students express a strong desire for advisor contact and place a high value on academic advising relative to other student services (Wyckoff, as cited in Cuseo, 2004).

One clear way that institutions can provide positive and influential student-faculty contact is through academic advising as described in this study. Given the empirical association between such contact and student retention, it is reasonable to assert that quality advising will have an impact on student retention.

C. THE ASSESSMENT OF ACADEMIC ADVISING

The third part of this chapter reviews the practice of assessing academic advising. To ensure high-quality academic advising for its students, an institution needs a systematic measure of its effectiveness. Assessment is used to determine whether the goals of programs and the needs of student are being met. Described in the literature, assessment is an ongoing process focusing on the systematic collection, review, and use of information regarding student learning, with the goal of improving student learning and development (Angelo, 1995; Ewell, 1994, 2002).

If academic advising is to be an educationally purposeful activity, then it is important to assess it as a function of higher education. Results of advising assessment can be used by policymakers, managers, and staff for any of the following purposes: to measure the effectiveness of the advising program (e.g., department-level or campus-wide), individual advisor improvement, recognition and reward (especially for faculty advisors, who often place teaching and research ahead of advising), to design and focus advising training strategies, to find out areas of advising weaknesses, and to provide support for advising program development (since advising programs are quite vulnerable to budget cuts). Ultimately, the reason to assess an advising program is to ensure high-

quality advising since it is recognized as a major contributor to student satisfaction, success, and retention.

Reports about the overall quality of advising over the past few decades have not been very encouraging. A national report issued by the Carnegie Foundation, based on three years of campus visits and extensive national survey research, arrived at the following conclusion: “We have found advising to be one of the weakest links in the undergraduate experience. Only about a third of the colleges in our study had a quality advisement program that helped students think carefully about their academic options (Boyer, 1987, p. 51). Student opinion surveys, as well as the 1970, 1983, and 1987 American College Testing (ACT) surveys, supported the notion that academic advising programs were not particularly effective and seemed to remain unfocused (Habley, 1998). Research on student satisfaction with the quality of academic advisement in higher education reveals a pattern of disappointing findings (Astin, 1993; Habley & Morales, 1998).

1. Assessment approaches and methods

Since there are numerous approaches to delivering advising to a wide range of students, the assessment of advising can be complicated (Banta, Hansen, Black & Jackson, 2002). As with any assessment plan, one needs to determine the goals and objectives of the assessment activity. For instance, is advising assessment intended to improve the performance of individual advisors, or to improve the whole advising delivery system? Effective planning for a system-wide assessment brings careful scrutiny to the many aspects of advising and reveals its deep complexity. While the basic unit of

advising is a one-to-one relationship between advisor and advisee, it is more than this dyad — it is a system, with many approaches to assessing it:

- The *levels* of advising to be assessed: the individual, the program (such as cross-disciplinary studies, or honors programs), the academic department, the college, and the university;
- The *aspects* of advising: the process (including policies, structure, communication, training) or outcomes (enrollments, performance, graduation rates) or both;
- The *delivery model* of advising: via faculty, professional staff, or a combination;
- The *function*: prescriptive (to give information and tell students what to do) or developmental (to promote growth of the whole person and include career and life goals;)
- The *data sources*: surveys, interviews, focus groups, student performance, and other assessment documents;
- The *decision-makers*: program directors, department heads, deans, provosts, and presidents.

The literature on advising identifies assessment in two typical approaches: individual and program levels. In individual assessment, the core elements of advisor behavior—availability, knowledge, and helpfulness—are the focus of assessment (Creamer & Scott, 2000). Four primary methods are utilized: student evaluation, self-evaluation, supervisory performance review, and peer review (Habley, 2003).

Student evaluation of advisors may be the most direct and useful method of assessing advising effectiveness, since advisees are the recipients of the service (Habley,

2003). Students typically provide feedback through either surveys or focus group participation. Surveys can provide quantitative data to measure student satisfaction with advisor behavior and characteristics. Focus groups allow for the collection of qualitative data, with participants expressing their thoughts, feelings, and perceptions in their own words. Focus groups are effective for identifying outstanding advisors as well as the traits students associate with good advising (Creamer & Scott, 2000). Focus groups can supplement data gathered in surveys, and can provide more in-depth information about certain issues that are indicated in a survey. A use of both methods is effective for gathering a wide range of data.

2. Examples of advising assessment

The literature has numerous examples of examples of advising assessment by survey methods, including satisfaction and expectation (Hanson & Raney, 1993) effectiveness of advising models (Milville & Sedlacek, 1995), and sources of advising (Reinarz & Ehlrich, 2002).

D. SUMMARY AND CONTRIBUTION OF THIS STUDY

The topics of interdisciplinary study, academic advising, and assessment have been reviewed in this section. With an increasingly greater role in undergraduate education, interdisciplinary study is making an impact on curriculum and pedagogy. Due to its complex nature, interdisciplinary study needs continued examination at many levels.

One approach to examining interdisciplinarity is to consider how it creates challenges to the services and support of students, such as the practice of academic

advising. Students in interdisciplinary programs are required to understand the multiple and complex approaches to curriculum content and the relationships between the disciplines involved. What kind of guidance do these students ask for from advisors? One research question for this study addresses the specific reasons students go to see their advisor.

The challenge for advisors is that they typically are trained to advise or teach in one discipline, and not across them (especially in the case of faculty advisors). When serving students in interdisciplinary programs, advisors need to understand the logic and structure of interdisciplinary curricula, as it adds to the complexity of learning outcomes and advising. This study considers the attributes of advisors that students find to be important, such as knowledge of the curriculum and the ability to provide career planning.

III. METHODOLOGY

This chapter describes the research methodology of the study, with five sections: the institutional setting, the participants, the survey instrument, data collection, and statistical analysis.

A. INSTITUTIONAL SETTING

This study used survey data collected in April 2004 by a Task Force conducting institutional research at the university. The Task Force examined advising in order to provide an internal benchmarking to share best practices, address unmet needs, and propose initiatives that will support effective advising. The data collection was not part of a formal assessment of advising; rather it was to find out how students were experiencing advising. The findings of the Task Force is intended to be used to improve advising by creating a model for a university-wide systematic and ongoing assessment process.

The university is a highly selective private research university with six college units in these areas of study: business administration, computer science, engineering, fine arts, the humanities and social sciences, and the physical and natural sciences. Enrollment is approximately 5,100 undergraduate students and 4,000 graduate students. The undergraduate student population is mostly of traditional college age (18-22 years). At the time of the Task Force's survey, there were 5, 095 undergraduates enrolled, based on an enrollment services report at the time.

This particular university was chosen as the setting for conducting this study of interdisciplinary advising for two reasons. First, the university's Task Force has data available from its student survey of advising. Respondents' primary academic majors and degree programs are identifiable, enabling the researcher to distinguish between those in interdisciplinary programs and those who are not.

Second, this university highly values interdisciplinary learning at the undergraduate level. In addition to offering interdisciplinary majors and minors to students, the university supports "integrative study" initiatives that supports course design, research projects, and other learning experiences intended to broaden students' exposure to interdisciplinary study. In addition to the six college units listed above, the university also offers interdisciplinary degree programs in "Humanities and Arts" and "Science and Arts." The results of this study will provide insight into the type of guidance students need in such an academic environment.

B. PARTICIPANTS

The Task Force administered the student advising survey as a census survey, inviting all undergraduate students to participate. The intent was to obtain responses from all academic units and from each student cohort (freshman through senior). A total of 2,477 students responded, 48.6% of the total undergraduate population of 5,095. Of the 2,477 responses, 2,458 were usable. For this study, all respondents are divided into groups based on their academic areas of study. Nine areas are identified: Business Administration, Computer Science, Engineering, Fine Arts, the Humanities, the Social Sciences, the Physical & Natural Sciences, Interdisciplinary Program students, and

Undecided students. Two groups—the Humanities and the Social Sciences—were created by separating the College of Humanities and Social Sciences into two distinct areas of study. The group of undecided students are students in the College of Humanities and Social Sciences who have not yet declared their areas of study. Table 1 shows the distribution of survey responses by area of study. Table 2 shows the stratification of participants by class year.

Table 1: Survey Respondents by Area of Study

Area of study	n	% of survey
Business administration	201	8.2
Computer Science	284	11.6
Engineering	703	28.7
Fine Arts	338	13.8
Humanities	63	2.6
Interdisciplinary	270	11.0
Sciences	292	11.9
Social Sciences	181	7.4
Undecided	116	4.7
No response	10	0.4
Total	2,458	100.0

Table 2: Survey Response Rate by Class Year

Year	n	% of survey
First-year	684	28.0
Second-year	635	26.0
Third-year	567	23.1
Fourth-year	496	20.2
Fifth-year and beyond	62	2.5
No response	14	0.6
Total	2,458	100.0

C. INSTRUMENTATION

The Task Force designed an online survey based on the findings of its undergraduate student focus group interviews. Ten focus groups were conducted in the spring of 2004 to explore students' perceptions and concerns about advising and find emerging themes and issues that could be addressed further in the survey. There were focus groups for each college unit, one for students in interdisciplinary programs, one for minority students, and one for international students. In each group, students discussed the ways in which they engage with their advisors, such as how often they are in contact with them and for what reasons. From a content analysis of these focus group discussions there emerged a number of topics that the committee determined should be addressed in the survey.

Students were most vocal about advising issues that were perceived to be experienced much differently among students across campus. These included: the availability of their advisor, how frequently they met with their advisor, for what reasons they met with their advisor, their advisors' knowledge of academic programs outside their own, and what they expect to get from advising.

The Task Force's survey asked the student population questions addressing these issues. Students were asked to consider their advising experience in just the past academic year (2003-2004) instead of across their entire undergraduate experience. This frame of reference allowed an examination of differences in the way each class year experiences their advising.

The Task Force pretested the survey instrument to examine the testing procedures and items. Salant and Dillman (1994) recommend the use of pretesting before the primary data collection procedures to determine how easily the directions are followed, how long it takes to complete the instrument, and how appropriate the items are for the target population. Four undergraduate students tested the survey by responding to each item and providing feedback indicating the items' relevance to their advising experience and whether there was any confusion in the survey's wording. After revising a number of items, the task Force posted the survey onto the commercial website of an online survey provider.

The survey consisted of thirteen items. The complete list of survey items is found in Appendix A. Not all were used for this study. The items used are grouped in the following manner.

Student Demographics. The survey item was:

- "What is your primary college or unit?"

Response options given were the colleges and degree programs available to undergraduate students.

Engagement with Advisor. The survey items were:

- "About how many times did you visit your academic advisor this past year?"

Response options: Zero times, Once, Twice, Three times, Four or more times.

- "Students often receive advice from more than one source. How often did you seek guidance from each of these sources this year?" The sources listed were: Academic advisor, Other faculty members/instructors, Friends/peers, Family members, Career Center staff, Academic Development staff, Counseling/Psychological Services, Student Affairs/Residence Life staff, Athletic team coaches, Undergraduate catalog.

For each source, the response options were: Often, Sometimes, Rarely, Never.

Content of Advising. The survey item was "How often have you seen an academic advisor this year for each of the following topics?" The topics were:

- Choosing specific courses;
- Long-range course (curriculum) planning;
- For help getting into certain classes;
- General education requirements;
- Academic rules, policies, and procedures;

- Learning about your field of study;
- Tips for improving study skills;
- Career goals or plans;
- Graduate or professional school;
- Getting referrals to other people for help;
- Personal advice;
- Seeking admission into another college or department;
- Experiential learning (internships research co-ops);
- Study abroad.

For each topic, the response options were: Often, Sometimes, Rarely, or Never.

Satisfaction and Importance Rating for Advisor Practices. The survey item was “Rate the importance of these practices of your primary academic advisor and rate your satisfaction with these practices.” The practices were:

- Has accessible office hours;
- Is responsive to emails/phone calls;
- Is knowledgeable of major's curriculum;
- Is knowledgeable of general education requirements;
- Is knowledgeable of other academic programs;
- Knows how to find accurate information;
- Helps me connect with other people.

For rating the importance of each practice, response options were: Very important, Somewhat important, A little important, or Not important. For rating

satisfaction with each practice, response options were: Completely satisfied, Mostly satisfied, Equally satisfied and unsatisfied, Mostly unsatisfied, or Completely unsatisfied.

Satisfaction and Importance Rating for Advisor Personal Characteristics. The survey item was "Rate the importance of these characteristics of your primary academic advisor and rate your satisfaction with these characteristics." The characteristics were:

- Is friendly and approachable;
- Gives me as much time as I need when we meet;
- Takes initiative to contact me;
- Takes personal interest in me and my interests abilities and needs;
- Keeps me updated on my academic progress;
- Assists me with long-term educational plans;
- Helps me make important educational decisions.

For rating the importance of each characteristic, response options were: Very important, Somewhat important, A little important, or Not important. For rating satisfaction with each characteristic, response options were: Completely satisfied, Mostly satisfied, Equally satisfied and unsatisfied, Mostly unsatisfied, or Completely unsatisfied.

Advising Quality. The survey item was:

- "How would you describe the overall quality of this year's academic advising experience?"

Response options were : Excellent, Good, Fair, Disappointing, Poor.

D. SURVEY DATA COLLECTION

In April 2004 the Task Force sent an electronic mail (email) invitation to students to take the online survey. The message described the survey was part of an investigation of students' experiences with academic advising, and was to be used to explore ways of enhancing undergraduate advising. Students were directed to a URL address on the Internet where they could access the online survey. Respondents were told that their email addresses would be retained in the process in order to ascertain their college and major affiliation. They were also assured that the Task Force would remove personal identification markers when processing the data. Once the survey was closed, the raw data were downloaded from the website for analysis. A copy of the invitation is found in Appendix A.

A total of 2,477 submissions were collected. Twelve respondents submitted completed surveys twice. Duplicate surveys were identified using the email address of the respondent, and the second survey response from each pair was eliminated from the data set. Seven other respondents had answered only three or fewer survey items, and these responses were eliminated. The final number of usable responses in the data set was 2,458.

E. DATA ANALYSIS

Data from the completed survey were analyzed using The Statistical Package for the Social Sciences (SPSS) computer software. The research questions of this study are listed below along with their corresponding survey questions, their variables to be measured, and the data analysis to be used to answer each question.

For each research question, dependent variables were measured with ordinal data, so descriptive statistics were used to summarize mean frequencies. To answer each question, mean frequencies were compared in two ways. First, student responses were divided into two groups: those in interdisciplinary programs and those who are not. The mean frequencies for the two groups of students were compared in order to determine the extent of the differences between them. A one-way analysis of variance was conducted, and a t-test was used to test the significance of the differences of the means of the two groups.

The second comparison of means was between each of the different areas of study; i.e. the mean responses of the interdisciplinary students were compared to the means of each of the other eight student groups. A post-hoc test of multiple comparisons, using the Tukey Honestly Significant Difference (HSD) procedure, was used to test the significance between the interdisciplinary students and each of the other areas of study. This was compared the mean frequencies of response for each group.

1. Research question one

How often do students in interdisciplinary programs and those in disciplinary programs make contact with their primary academic advisors? Does the frequency of visits by the students in interdisciplinary programs differ significantly from the frequency of students in noninterdisciplinary programs?

Survey item

"About how many times did you visit your academic advisor this past year?"

Variables

Dependent: Number of Visits to Advisor

Independent: Students' Area of Study

2. Research question two

What competencies of their primary advisor (i.e. advisor practices and knowledge) are most important to students in interdisciplinary programs? How satisfied are students with their advisors regarding these competencies? How does this compare to the students in noninterdisciplinary programs?

Survey item

"How often have you seen an academic advisor this year for each of the following reasons?"

Variables

Students were asked how often they have seen their advisor for each of fourteen specific reasons. Given this number of reasons, an exploratory factor analysis was performed to determine if composite variables can be identified. The analysis was performed by SPSS using Principle Axis Factoring and Varimax Rotation, and the resulting correlation matrix for the reasons for visiting an advisor is shown in detail Appendix B, Table B1.

The analysis found two factor loadings (Cronbach's Alpha = .894). Table 3 show four items that have high loadings for Factor 1: Choosing Courses, Course Planning, Getting into Classes, and General Education Requirements. These items involve learning

about, and planning for, one's major curriculum. Table 4 shows seven items that have high loadings for Factor 2: Learn about Field of Study, Study Skills, Career Goals or Plans, Graduate or Professional School, Getting Referrals, Personal Advice, and Experiential Learning. These items are not related specifically to completing curriculum requirements, but instead are related to experiences outside the curriculum.

From these two factor loadings, two composite variables can be created; from Factor 1 the variable Intracurricular and from Factor 2 the variable Extracurricular. The survey items Academic Rules, Policies, & Procedures, Admission into Another Unit, and Study Abroad do not load significantly onto a factor and have been treated as separate variables.

Table 3: Survey Items with High Factor 1 Loading for Reasons Students Visit their Advisors

Reasons for visiting advisor	Factor 1 loading
Choosing Courses	.747
Course Planning	.704
Getting into Classes	.531
General Education Requirements	.674

Cronbach's alpha = .894

Table 4: Survey Items with High Factor 2 Loading for Reasons Students Visit their Advisors

Reasons for visiting advisor	Factor 2 loading
Learn about Field of Study	.637
Study Skills	.601
Career Goals or Plans	.745
Graduate or Professional School	.646
Getting Referrals	.664
Personal Advice	.642
Experiential Learning	.651

Cronbach's alpha = .894

With composite variables identified, the following variables were measured:

Dependent: Intracurricular

Extracurricular

Academic Rules, Policies, & Procedures

Admission into Another Unit

Study Abroad

Independent: Students' Area of Study

3. Research question three

What competencies of their primary advisor (i.e. advisor availability, practices and knowledge) are most important to students in interdisciplinary programs? How satisfied are students with their advisors regarding these competencies? How does this compare to the students in noninterdisciplinary programs?

Survey item

"Rate the importance of these practices of your primary academic advisor, and rate your satisfaction with these practices."

Variables

For rating the importance of the seven listed advisor competencies, an exploratory factor analysis was performed to determine if composite variables could be identified. The analysis was performed by SPSS using Principle Axis Factoring and Varimax Rotation, and the resulting correlation matrix for the importance of advisor competencies is shown in detail in Appendix B, Table B2.

The analysis found two factor loadings (Cronbach's Alpha = .633). Table 5 shows two items to have high loadings for Factor 1: Knowledge of General Education and Knowledge of Other Programs. One interpretation for what is common to them is that they may be considered competencies for noncurricular knowledge. Table 6 shows three items to have high loadings for Factor 2: Responsiveness, Knowledge of Curriculum, and Knows How to Find Information. What may be common to these is a competency for curricular knowledge.

From these two factor loadings, two composite variables can be created; one labeled as Curricular and the other as Noncurricular. The survey items Accessible hours and Helps Me Connect with Others do not load onto a factor and have been treated as separate variables.

Table 5: Survey Items with High Factor 1 Loading for Level of Importance of Advisor Competencies

Competencies	Factor loading
Knowledge of general education	.407
Knowledge of other programs	.788

Cronbach's Alpha = .633

Table 6: Survey Items with High Factor 2 Loading for Level of Importance of Advisor Competencies

Practices	Factor loading
Responsive	.520
Knowledge of Curriculum	.533
Knows How to Find Information	.455

Cronbach's Alpha = .633

With composite variables identified, the following variables have been measured to examine the importance of advisor competencies:

Dependent: Curricular

Noncurricular

Accessible Hours

Helps Me Connect with Others

Independent: Students' Area of Study

For rating the satisfaction with the seven advisor competencies, the competencies were subjected to exploratory factor analysis to determine if composite variables could be identified. The analysis was performed by SPSS using Principle Axis Factoring and Varimax Rotation, and the resulting correlation matrix for the satisfaction with advisor competencies is shown in detail in Appendix B, Table B3. The analysis found that each practice loaded onto one factor (Cronbach's Alpha = .903) as shown in Table 7. This single composite variable is labeled Satisfaction with Competencies.

With the composite variable identified, the following variables were measured to examine the satisfaction with advisor competencies:

Dependent: Satisfaction with Competencies

Independent: Students' Area of Study

Table 7: Factor Loading for Level of Satisfaction with Advisor Competencies

Competencies	Factor loading
Accessible hours	.699
Responsive	.652
Knowledge of curriculum	.794
Knowledge of general education	.811
Knowledge of other programs	.780
Knows how to find information	.846
Helps connect with others	.721

Cronbach's Alpha = .903

4. Research question four

What personal characteristics of their primary advisor (e.g., approachability, taking personal interest in students, assisting with long-term educational plans) are most important to students in interdisciplinary programs? How satisfied are students with each of these characteristics? How does this compare to students in noninterdisciplinary programs?

Survey item

"Rate the importance of these characteristics of your primary academic advisor, and rate your satisfaction with these characteristics."

Variables

For rating the importance of the seven listed advisor characteristics, the characteristics were subjected to exploratory factor analysis to determine if composite variables could be identified. The analysis was performed by SPSS using Principle Axis Factoring and Varimax Rotation, and the resulting correlation matrix for the importance of the advisor characteristics is shown in detail in Appendix B, Table B4.

The analysis found two factor loadings (Cronbach's Alpha = .762). Table 8 show four items to have high loadings for Factor 1: Is Friendly and Approachable, Gives Me Enough Time, Takes Initiative to Contact Me, and Takes Personal Interest in Me. One interpretation for what is common to them is that they may be considered personal characteristics that demonstrate "caring" for the student. Table 9 shows two items to have high loadings for Factor 2: Assists Me with Long-term Educational Plans, and Helps Me Make Important Educational Decisions. These items may be interpreted as characteristics that provide "guidance" to students. From these two factor loadings, two composite variables can be created; one labeled Caring and the other labeled Guiding. The variable "Keeps Me Updated" does not load onto a factor and was treated as a separate variable.

Table 8: Survey Items with High Factor 1 Loading for Level of Importance of Advisor Characteristics

Personal characteristics	Factor loading
Is Friendly and Approachable	.428
Gives Me Enough Time	.460
Takes Initiative to Contact Me	.638
Takes Personal Interest in Me	.626

Cronbach's Alpha = .762

Table 9: Survey Items with High Factor 2 Loading for Level of Importance of Advisor Characteristics

Personal characteristics	Factor loading
Assists Me with Plans	.760
Helps Me Make Decisions	.609

Cronbach's Alpha = .762

With the composite variables identified, the following variables have been measured to examine the importance of advisor personal characteristics:

Dependent: Caring

Guiding

Keeps Me Updated

Independent: Students' Area of Study

For rating the satisfaction with the seven advisor personal characteristics, the characteristics were subjected to exploratory factor analysis to determine if composite variables could be identified. The analysis was performed by SPSS using Principle Axis Factoring and Varimax Rotation, and the resulting correlation matrix for the satisfaction with the advisor personal characteristics is shown in detail in Appendix B, Table B5. The analysis found that each practice loaded onto one factor (Cronbach's Alpha = .922) as shown in Table 10. This single composite variable is labeled Satisfaction with Characteristics.

Table 10: Factor Loading for Level of Satisfaction with Advisor Characteristics

Advisor personal characteristics	Factor
Is friendly and approachable	.704
Gives me enough time	.698
Takes initiative to contact me	.787
Takes personal interest in me	.846
Keeps me updated	.799
Assists me with plans	.855
Helps me make decisions	.856

Cronbach's Alpha = .922

With the composite variable identified, the following variables were measured to examine the satisfaction with advisor competencies:

Dependent: Satisfaction with Characteristics

Independent: Students' Area of Study

5. Research question five

Aside from their primary academic advisor, to what other sources do students in interdisciplinary programs go for advising? How does this compare students in noninterdisciplinary programs?

Survey item

"Students often receive advice from more than one source. How often did you seek guidance from each of these sources this year?"

Variables

For rating the frequency of use of the ten advising sources, the sources were subjected to exploratory factor analysis to determine if composite variables could be identified. The analysis was performed by SPSS using Principle Axis Factoring and Varimax Rotation, and the resulting correlation matrix for the advising sources is shown in detail in Appendix B, Table 6.

The analysis found three factor loadings (Cronbach's Alpha = .622). Table 11 shows two sources to have high loadings for Factor 1: Academic Advisor and Other Faculty Members. Table 12 shows two sources to have high loadings for Factor 2: Friends/peers, Family Members. Table 13 shows five sources to have high loadings for Factor 3: Career Center staff, Academic Development Staff, Counseling/Psych Services, Student Affairs, Athletic Coaches. What are common to these sources is that they are non-academic "staff" sources of advice.

From these three factor loadings, three composite variables can be created, labeled as Advisor/faculty" (since many faculty members are advisors, and students may go to them for their expertise in their field of study, whether or not they actually are advisors), Peers/family, and Staff. The survey item Catalog does not load onto a factor and was treated as a separate variable.

Table 11: Survey Items with High Factor 1 Loading for Sources of Advising

Source of advice	Factor loading
Academic advisor	.520
Other faculty members	.495

Cronbach's Alpha = .622

Table 12: Survey Items with High Factor 2 Loading for Sources of Advising

Source of advice	Factor loading
Friends/peers	.785
Family Members	.404

Cronbach's Alpha = .622

Table 13: Survey Items with High Factor 3 Loading for Sources of Advising

Source of advice	Factor loading
Career Center Staff	.400
Academic Development Staff	.561
Counseling/Psych Services	.474
Student Affairs	.566
Athletic Coaches	.405

Cronbach's Alpha = .622

With the composite variables identified, the following variables were measured to examine the sources of advising:

Dependent: Advisor/faculty
Peers/family
Staff
Catalog

Independent: Students' Area of Study

6. Research question six

What is the overall satisfaction of the advising experience of students in interdisciplinary programs and how does that compare to students in noninterdisciplinary programs?

Survey item

"How would you describe the overall quality of this year's academic advising experience?"

Variables

Dependent: Quality of Advising

Independent: Students' Area of Study

Summary

The six research questions of this study were answered by comparing the students' areas of study with the use of sixteen dependent variables. Descriptive statistics were used to make comparisons between mean frequencies of responses to the survey items.

IV. FINDINGS OF THE STUDY

The purpose of this study was to examine what differences, if any, exist in the advising experiences between students in interdisciplinary programs and those who are in different areas of study. This chapter presents the results of the data analysis for each research question, a summary of what was found, and unanticipated findings.

A. RESEARCH QUESTION ONE: CONTACT WITH ADVISOR

The first research question of this study asked "How often do students in interdisciplinary programs and those in disciplinary programs make contact with their primary academic advisors? Does the frequency of visits by the students in interdisciplinary programs differ significantly from the frequency of students in noninterdisciplinary programs?"

Table 14 shows the results of the independent samples t-test. The mean response of the interdisciplinary students was significantly higher than the mean response of the noninterdisciplinary students.

Table 14: Comparison of Mean Responses for Number of Times Students have Visited their Academic Advisor

Area of study	n	M	SD
Interdisciplinary	268	2.66	1.164
Noninterdisciplinary	2174	2.29	1.295
Total	2442	2.33	1.286

Note. Response options based on the following: 4 = four or more times, 3 = three times, 2 = two times, 1 = once, 0 = zero times.
$t(2, 2442) = 4.862$, $p < .05$

For the second comparison of mean frequencies, student responses were divided into the nine areas of study. The mean scores for each of the nine groups were compared statistically using the one-way ANOVA procedure. The result of the test revealed a significant difference among the groups ($F(8, 2433) = 54.96$, $p < .05$).

Table 15 shows the results of the multiple comparisons using the Tukey HSD procedure. Interdisciplinary students ranked fifth out of the nine areas, significantly lower than the highest ranked area (Computer Science), and significantly higher than the lowest four areas (Fine Arts, Social Sciences, Engineering, Humanities). The multiple comparison data resulting from the Tukey HSD procedure are shown in detail in Appendix B, Table B7.

Table 15: Ranking of Mean Number of Visits by Area of Study

Rank	Area of study
1	Computer science*
2	Business administration
3	Natural & physical sciences
4	Undecided
5	Interdisciplinary programs
6	Fine arts*
7	Social Sciences*
8	Engineering*
9	Humanities*

* Difference from Interdisciplinary programs is statistically significant ($p < .05$)
Note: for ranking, 1 = highest mean, 9 = lowest mean.

B. RESEARCH QUESTION TWO: ADVISING CONTENT

The second research question of this study asked: "What competencies of their primary advisor (i.e. advisor practices and knowledge) are most important to students in interdisciplinary programs? How satisfied are students with their advisors regarding these competencies? How does this compare to the students in noninterdisciplinary programs?" The reasons, as determined by factor analysis in chapter two, are: Intracurricular, Extracurricular, Academic Rules, Policies & Procedures, Admission into Another Unit, and Study Abroad.

Table 16 shows the results of the independent samples t-test. Students in interdisciplinary programs selected Intracurricular as the most frequent reason, followed in order by Academic Rules, Policies & Procedures, Extracurricular, Admission into Another Unit, and Study Abroad. All but one of the means were significantly higher than the means of the students in noninterdisciplinary programs (the exception being Admission into Another Unit.

Table 16: Comparison of Means for the Reasons Students Visit Their Advisor

	Interdisciplinary			Noninterdisciplinary				
Reasons	n	M	SD	n	M	SD	*t*	*p*
Intracurricular	268	2.41	.751	2173	2.26	.804	3.105	.002
Academic Rules and Procedures	265	1.79	.887	2156	1.65	.903	2.482	.014
Extracurricular	267	1.70	.656	2162	1.58	.678	2.752	.006
Admission into Another Unit	266	1.45	.806	2149	1.38	.772	1.433	.153
Study Abroad	264	1.44	.792	2140	1.33	.743	1.978	.049

Note. Response options based on the following: 4 = often, 3 = sometimes, 2 = rarely, 1 = never.

For the second comparison of mean frequencies, student responses were divided into the nine areas of study. The mean scores for the nine areas were compared statistically for each of the four reasons using the one-way ANOVA procedure. The results of the test revealed a significant difference among the areas for each of the four variables: Intracurricular ($F(8, 2432) = 19.946$, $p < .05$), Extracurricular ($F(8, 2420) = 11.818$, $p < .05$), Academic Rules and Procedures ($F(8, 2412) = 3.619$, $p < .05$),

Admission into Another Unit ($F(8, 2406) = 8.241$, $p < .05$),, and Study Abroad ($F(8, 2395) = 18.762$, $p < .05$)

Table 17 shows the results of the multiple comparisons using the Tukey HSD procedure. For the composite Intracurriculum, Business Administration ranked first. Interdisciplinary ranked fourth out of the nine areas, with no significant difference from the three higher-ranked areas, and significantly higher than the lowest three areas (Social Sciences, Engineering, Humanities). For Academic Rules, Regulations & Procedures, Business Administration ranked first. Interdisciplinary ranked second, significantly higher from the eighth-ranked area (Engineering). For the composite Extracurriculum, Natural & Physical Sciences ranked first. Interdisciplinary ranked second with no significant difference with any other area. For Study Abroad, Business Administration ranked first. Interdisciplinary students ranked fourth, significantly lower than the highest area and significantly higher than the two lowest ranked areas (Engineering and Computer Science). The multiple comparison data resulting from the Tukey HSD procedure are shown in detail in Appendix B, Tables B8 through B12.

Table 17: Ranking of Means for Reasons for Visiting One's Advisor by Area of Study

	Reasons				
Rank	Intracurriculum	Acad. Rules, Policies, Proc.	Extracurriculum	Admission into Another Unit	Study abroad
1	Business Adm.	Business Adm	Nat. sci.	Undecided*	Business Adm.*
2	Nat. Sciences	Interdiscipl.	Interdiscipl.	Interdiscipl.	Fine Arts
3	Computer Sci	Computer Sci.	Business Adm.	Business Adm.	Humanities
4	Interdiscipl.	Fine Arts	Computer Sci.	Fine Arts	Interdiscipl.
5	Undecided	Undecided	Social Sci.	Nat. sci.	Social Sci
6	Fine Arts	Nat. Sci.	Fine Arts	Social Sci.	Nat. sci
7	Social Sci.*	Social Sci.	Humanities	Computer Sci.	Undecided
8	Engineering*	Engineering*	Engineering	Engineering	Engineering*
9	Humanities*	Humanities	Undecided	Humanities	Computer sci*

* Difference from Interdisciplinary programs is statistically significant.
Note: for ranking, 1 = highest mean, 9 = lowest mean.

C. RESEARCH QUESTION THREE: ADVISOR COMPETENCIES

The third research question of this study asked: "What competencies of their primary advisor (i.e. advisor availability, practices and knowledge) are most important to students in interdisciplinary programs? How satisfied are students with their advisors regarding these competencies? How does this compare to the students in noninterdisciplinary programs?"

Table 18 shows the results of the independent samples t-tests for ranking the importance of advisor competencies. Students in interdisciplinary programs ranked Curricular as the most important reason, followed in order by Accessible Hours, Helps

Me Connect with Others, and Noncurricular. The interdisciplinary means were significantly higher than the means for noninterdisciplinary students for the competencies Curricular, Accessible Hours, and Helps Me Connect with Others. There was no significant difference for the competency Noncurricular.

Table 18: Comparison of Mean Responses for Rating Importance of Advisor Competencies

	Interdisciplinary			Noninterdisciplinary				
Competencies	n	M	SD	n	M	SD	*t*	*p*
Curricular	260	3.98	.365	2010	3.93	.423	2.088	.038
Accessible Hours	260	3.61	.669	2018	3.47	.777	3.111	.002
Helps Me Connect with others	259	3.39	.772	1998	3.24	.828	2.952	.003
Noncurricular	260	3.33	.606	2008	3.34	.577	-.264	.792

Notes. Response options based on the following: 4 = very important, 3 = somewhat important, 2 = a little important, 1 = not important.

For the second comparison of mean frequencies, student responses were divided into the nine areas of study. The mean scores among the nine groups were compared statistically for each of the four reasons using the one-way ANOVA procedure. The results of the test revealed a significant difference among the groups for each of the variables: Curricular ($F(8, 2261) = 8.474$, $p < .05$), Noncurricular ($F(8, 2259) = 2.943$, $p < .05$), Accessible Hours ($F(8, 2269) = 13.186$, $p < .05$), and Helps Me Connect with Others" ($F(8, 2248) = 2.498$, $p < .05$).

Table 19 shows the results of the multiple comparisons using the Tukey HSD procedure. For the composite variable Curricular, Computer Science ranked first. Interdisciplinary ranked third, with a significant difference with only one group, Engineering (ranked eighth). For Accessible Hours, Business Administration ranked first. Interdisciplinary ranked third, with a significant difference with two groups, Natural Sciences (ranked eighth) and Engineering (ranked ninth). For the competency Helping Me to Connect with Others, Interdisciplinary ranked first, with a significant difference with two groups, Engineering (ranked eighth) and Computer Science (ranked ninth). For the competency Noncurricular, Undecided ranked first, significantly higher than Interdisciplinary, which ranked fifth. The multiple comparison data resulting from the Tukey HSD procedure are shown in detail in Appendix B, Tables B13 through B16.

In terms of satisfaction with the competencies, one composite variable was determined by factor analysis. Table 20 shows the independent samples t-test comparing the interdisciplinary and noninterdisciplinary areas. With $p = .104$, there was no significant difference.

Table 19: Ranking of Means for Importance of Advisor Competencies by Area of Study

	Competencies			
Rank	Intracurricular	Accessible Hours	Help Connect with Others	Extracurricular
1	Computer Sci	Business Admin	Interdisciplinary	Undecided*
2	Natural sciences	Undecided	Natural sciences	Business Admin
3	Interdisciplinary	Interdisciplinary	Fine arts	Natural sciences
4	Fine arts	Fine arts	Social Sciences	Computer Science
5	Business Admin	Computer Science	Humanities	Interdisciplinary
6	Social Sciences	Humanities	Business Admin	Fine arts
7	Undecided	Social Sciences	Undecided	Engineering
8	Engineering*	Natural sciences*	Engineering*	Social Sciences
9	Humanities	Engineering*	Computer sci*	Humanities

* Difference from Interdisciplinary programs is statistically significant.
Note: for ranking, 1 = highest mean, 9 = lowest mean.

Table 20: Comparison of Mean Responses for Rating Satisfaction with Advisor Competencies

Area of study	n	M	SD
Interdisciplinary	260	4.10	.751
Noninterdisciplinary	1994	4.02	.856
Total	2254	4.03	.845

Notes. Response options based on the following: 5 = completely satisfied, 4 = mostly satisfied, 3 = equally satisfied and dissatisfied, 2 = mostly dissatisfied, 1 = completely dissatisfied.

For the second comparison of mean frequencies, student responses were divided into the nine areas of study. The mean scores among the nine groups were compared statistically for the composite variable using the one-way ANOVA procedure. The result of the test revealed a significant difference among the groups ($F_{(8, 2245)} = 33.884$, $p < .05$).

Table 21 shows the results of the multiple comparisons using the Tukey HSD procedure. The highest ranked group, Computer Science, had a significantly higher mean than Interdisciplinary, which ranked third. The mean for Interdisciplinary was significantly higher than the lowest three ranked groups, Engineering (seventh), Social Sciences (eighth), and Humanities (ninth). The multiple comparison data resulting from the Tukey HSD procedure are shown in Appendix B, Table B17.

Table 21: Ranking of Means for Satisfaction with Advisor Competencies by Area of Study

Rank	Group
1	Computer Science*
2	Natural & physical sciences
3	Interdisciplinary programs
4	Business Administration
5	Fine arts
6	Undecided
7	Engineering*
8	Social Sciences*
9	Humanities*

* Difference from Interdisciplinary programs is statistically significant.
Note: for ranking, 1 = highest mean, 9 = lowest mean.

D. RESEARCH QUESTION FOUR: ADVISOR CHARACTERISTICS

The fourth question asked: "What personal characteristics of their primary advisor (e.g., approachability, taking personal interest in students, assisting with long-term educational plans) are most important to students in interdisciplinary programs? How satisfied are students with each of these characteristics? How does this compare to students in noninterdisciplinary programs?" Table 22 shows the results of the independent samples t-tests for ranking the importance of advisor personal characteristics. Students in interdisciplinary programs ranked Guiding as most important, followed by Caring and Keeps Me Updated. There is a significant difference for one characteristic – Keeps Me Updated.

Table 22: Comparison of Mean Responses to Importance of Advisor Personal Characteristics

Personal characteristics	Interdisciplinary			Noninterdisciplinary				
	n	M	SD	n	M	SD	*t*	*p*
Guiding	258	3.57	.547	2000	3.51	.616	1.658	.098
Caring	259	3.44	.502	2004	3.40	.494	1.407	.160
Keeps Me Updated	258	3.34	.738	1997	3.21	.834	2.617	.009

Note. Response options based on the following scale: 4 = very important, 3 = somewhat important, 2 = a little important, 1 = not important.

The mean scores among the nine groups were compared statistically for each of the three personal characteristics using the one-way ANOVA procedure. The results of

the test revealed a significant difference among the groups for each of the variables: Caring ($F(8, 2254) = 6.242$, $p < .05$), Guiding ($F(8, 2249) = 3.168$, $p < .05$), and Keeps Me Updated ($F(8, 2246) = 2.741$, $p < .05$).

Table 23 shows the results from the multiple comparisons using the Tukey HSD procedure. Natural & Physical Sciences ranked first for the variable Guiding, and Humanities ranked first for both Caring and Keeps Me Updated. Students in interdisciplinary programs ranked fourth for both Guiding and Keeps Me Updated, with no statistically significant differences with any other group. Interdisciplinary ranked fifth in caring, with a significant difference with one group, Computer Science (which ranked ninth).

The data resulting from the Tukey HSD procedure are shown in detail in Appendix B, Tables B18 through B20.

In terms of satisfaction with the competencies, one composite variable was determined by factor analysis. Table 24 shows the independent samples t-test comparing the interdisciplinary and noninterdisciplinary areas. With $p = .029$, there is a significant difference between the two groups.

Table 23: Ranking of Means for Importance with Advisor Personal Characteristics by Area of Study

	Characteristics		
Rank	Guiding	Caring	Keeps Me Updated
1	Natural sciences	Humanities	Humanities
2	Humanities	Undecided	Business Admin
3	Social Sciences	Natural sciences	Undecided
4	Interdisciplinary	Business Admin	Interdisciplinary
5	Undecided	Interdisciplinary	Fine arts
6	Business Admin	Social Sciences	Computer Science
7	Computer Science	Fine arts	Natural sciences
8	Engineering	Engineering	Social Sciences
9	Fine arts	Computer Science*	Engineering

* Difference from Interdisciplinary programs is statistically significant.

Table 24: Comparison of Mean Responses for Satisfaction with Advisor Personal Characteristics

Area of study	n	M	SD
Interdisciplinary	259	3.96	.857
Noninterdisciplinary	1983	3.83	.967
Total	2242	3.85	.955

Notes. Response options based on the following: 5 = completely satisfied, 4 = mostly satisfied, 3 = equally satisfied and dissatisfied, 2 = mostly dissatisfied, 1 = completely dissatisfied.

The mean scores among the nine groups were compared statistically for each of the four reasons using the one-way ANOVA procedure. The results of the test revealed a significant difference among the groups for the variable ($F(8, 2233) = 27.915$, $p < .05$).

Table 25 shows the results of the multiple comparisons using the Tukey HSD procedure. Students in interdisciplinary programs ranked third, significantly different from four groups: Computer Science (ranked highest), Engineering (seventh), Social Science (eighth), and Humanities (ninth).

The data resulting from the Tukey HSD procedure are shown in detail in Appendix B, Table B21.

Table 25: Rankings of Groups for Variables for Satisfaction with Advisor Personal Characteristics

Rank	Group
1	Computer Science*
2	Natural & physical sciences
3	Interdisciplinary programs
4	Business Administration
5	Fine arts
6	Undecided
7	Engineering*
8	Social Sciences*
9	Humanities*

* Difference from Interdisciplinary programs is statistically significant.

E. RESEARCH QUESTION FIVE: SOURCES OF ADVISING

The fifth research question of this study asked "Aside from their primary academic advisor, to what other sources do students in interdisciplinary programs go for advising? How does this compare students in noninterdisciplinary programs?" The factor analysis in chapter two determined three composite variables: advisor/faculty, peers/family, and staff. One source remained separate: the catalog.

Table 26 shows the results of the independent sample t-tests comparison of the two groups. There was a significant difference between the two groups only for the Advisor/Faculty source.

Table 26: Comparison of Mean Responses for Advising Sources

	Interdisciplinary			Noninterdisciplinary				
Advising sources	n	M	SD	n	M	SD	t	*p*
Peers/Family	264	3.24	.707	2067	3.18	.725	1.280	.202
Advisor/Faculty	264	2.80	.705	2068	2.64	.737	3.463	.001
Catalog	264	2.68	1.106	2061	2.60	1.080	1.199	.231
Staff	264	1.37	.427	2059	1.36	.445	.201	.841

Notes. Response options based on the following: 4 = very important, 3 = somewhat important, 2 = a little important, 1 = not important.

The mean scores among the nine groups were compared statistically for each of the four sources using the one-way ANOVA procedure. The results of the test revealed a significant difference among the groups for each of the variables: Advisor/Faculty (*F*(8,

2323) = 16.683, $p < .05$), Peers/Family ($F(8, 2322) = 4.107$, $p < .05$), Staff ($F(8, 2269) = 13.186$, $p < .05$), and Catalog ($F(8, 2316) = 15.580$, $p < .0005$).

Table 27 shows the results of the multiple comparisons using the Tukey HSD procedure. For the Peer/Family variable, Business Administration ranked first, with Interdisciplinary rankled fifth and had no significant difference with any areas. For the Advisor/Faculty variable, Fine Arts ranked first, with Interdisciplinary ranked third, significantly different from one group (Engineering, ninth). For the Catalog variable, Undecided ranks first with Interdisciplinary ranked fifth, significantly different from two groups: Computer Science (ranked eighth) and Fine Arts (ranked ninth). For the Staff variable, Business Administration ranked first, with Interdisciplinary ranked fifth and had no significant difference with any areas.

The data resulting from the Tukey HSD procedure are shown in detail in Appendix B, Tables B22 through B25.

Table 27: Rankings of groups for variables for sources of advising

	Sources			
Rank	Peers?Family	Advisor/Faculty	Catalog	Staff
1	Business Admin	Fine arts	Undecided	Business Admin
2	Undecided	Natural sciences	Humanities	Social Sciences
3	Fine arts	Interdisciplinary	Social Sciences	Undecided
4	Humanities	Business Admin	Engineering	Engineering
5	Interdisciplinary	Computer Sci	Interdisciplinary	Interdisciplinary
6	Natural sciences	Humanities	Natural sciences	Humanities
7	Social Sciences	Social Sciences	Business Admin	Natural sciences
8	Computer Sci	Undecided	Computer Sci*	Computer Sci
9	Engineering	Engineering*	Fine arts*	Fine arts

* Difference from Interdisciplinary programs is statistically significant.

F. RESEARCH QUESTION SIX: QUALITY OF ADVISING

The sixth research question of this study asked: "What is the overall satisfaction of the advising experience of students in interdisciplinary programs and how does that compare to students in noninterdisciplinary programs?" Table 28 shows the results of the independent samples t-test used to test the significance of the difference of the means of the two groups. With $p = .004$, there is a significant difference.

Table 28: Comparison of Mean Responses for Quality of Advising

Area of study	n	M	SD
Interdisciplinary	262	3.99	.977
Noninterdisciplinary	2041	3.80	1.083
Total	2303	3.82	1.073

Response options based on the following: 5 = excellent, 4 = good, 3 = fair, 2 = disappointing, 1 = poor.
p value = .004.

The mean scores among the nine groups were compared statistically for each of the four sources using the one-way ANOVA procedure. The results of the test revealed a significant difference among the groups for Quality of Advising ($F(8, 2294) = 41.477$, $p < .05$).

Table 29 shows the results of the multiple comparisons using the Tukey HSD procedure. Interdisciplinary programs ranked fourth in quality. There was a significant difference with five other student groups: Computer Science (ranked first), Fine Arts (fifth), Engineering (seventh), Social Sciences (eighth), and Humanities (ninth).

The data resulting from the Tukey HSD procedure are shown in detail in Appendix B, Table B26.

Table 29: Rankings of Groups for Variables for Quality of Advising

Rank	Group
1	Computer Science*
2	Natural & physical sciences
3	Business administration
4	Interdisciplinary programs
5	Fine arts*
6	Undecided
7	Engineering*
8	Social Sciences*
9	Humanities*

* Difference from Interdisciplinary programs is statistically significant.

G. OBSERVATIONS ABOUT ADVISING MODELS

During the course of this study, it was observed that the type of advising models used by an academic advising program may have a significant impact on students' engagement with advising. The university at which this study has taken place has a range of different departmental advising models (as do many other institutions, with varying impact on student engagement; Pardee (2000), Reinarz (2000), Habley (2004)). In its own study, the university's Task Force identified four department-level undergraduate advising models used on its campus:

1. Full-time staff advisor model

One or several full-time professional staff advisor(s) provide primary academic advising for all students in a major or department.

2. Faculty advisor model

One (or several) faculty member(s) provide primary academic advising for all students in a major, department, or cohort.

3. Faculty-distributed with a central staff coordinator

Advising for a department is distributed among more than one faculty member, with a staff member serving as a central coordinator who provides administrative support for the faculty advisors.

4. Faculty-distributed with a central advisor

Advising for a department is distributed among more than one faculty member, with one staff or faculty advisor serving as a central coordinator who provides general academic information and referrals for students, and administrative support for faculty advisors.

5. Comparison of Advising Models

In an exploratory exercise, a comparison of mean responses for several dependent variables was conducted using the four advising models as independent variables. Table 30 shows the results of a comparison between each of the four models using the one-way ANOVA procedure for the variable Quality of Advising. The result of the test revealed a

significant difference among the groups ($p < .05$). The single faculty advisor model ranked the highest, and the single staff advisor model ranked second. Table 31 shows a comparison for the variable Visits to Advisor, also revealing a significant difference among the groups ($p < .05$). Again, the single faculty advisor model ranked the highest, and the single staff advisor model ranked second. For this university, these two models may prove to be the most effective model for student engagement. Additional analysis of the data for this study may provide further support for this claim.

Table 30: Comparison of Mean Responses for Quality of Advising by Advising Model

Advising model	n	M	SD
Missing value	6	3.67	1.033
Faculty advisor	601	4.24	1.028
Full-time staff advisor	738	3.88	.973
Faculty-distributed with a central faculty advisor	130	3.64	1.188
Faculty-distributed with a central staff advisor	816	3.48	1.052
Total	2291	3.82	1.071

Notes: Response options based on the following: 4 = four or more times, 3 = three times, 2 = two times, 1 = once, 0 = zero times.

Table 31: Comparison of Mean Responses for Number of Visits to Advisor by Advising Model

Advising model	n	M	SD
Missing value	7	2.29	1.496
Faculty advisor	637	2.79	1.1.64
Full-time staff advisor	777	2.58	1.252
Faculty-distributed with a central faculty advisor	136	2.27	1.325
Faculty-distributed with a central staff advisor	866	1.79	1.193
Total	2423	2.33	1.285

Notes: Response options based on the following: 5 = excellent, 4 = good, 3 = fair, 2 = disappointing, 1 = poor.

Previous studies have recognized advising delivery models as a significant influence on the quality of students' advising experiences (Miville & Sedlacek (1995); Habley & Morales (1998); Pardee, 2000).

V. SUMMARY AND DISCUSSION

This chapter presents the summary, conclusions, and recommendations for use of this study and for further research. The summary includes a review of the study's statement of the problem, its purpose, and a discussion of the findings organized around the six research questions that guided the study.

A. STATEMENT OF THE PROBLEM

Advising is increasingly recognized as integral to the mission of higher education (White, 2000). Efforts to make advising more effective include identifying the needs of specific student groups. The nature of interdisciplinary education presents challenges for advising students in such programs (Elsley, 2002; Gordon, 2002). There is very little research on the advising experiences of these students. Interdisciplinary study requires specific advising practices and focus, which need to be identified empirically in order to serve students more effectively.

B. PURPOSE OF THE STUDY

This study was undertaken to discover differences in the advising experiences that may inform academic advisors in order for them to serve interdisciplinary students more effectively. As (Lowenstein, 2000) writes, effective advising makes students aware of curriculum structure and goals, as well as aware of the range of resources available across campus.

This study has provided empirical data that may describe significant differences in experiences between students in interdisciplinary programs and students in noninterdisciplinary programs. Identifying these differences may help advisors better understand the demands of interdisciplinary study on advising.

C. SUMMARY OF FINDINGS FOR RESEARCH QUESTIONS

1. Research question one

The first question examined how often students have been in contact with their advisor in the past academic year. The mean for Interdisciplinary students is significantly higher than Noninterdisciplinary. When comparing the nine areas of study, Interdisciplinary students ranked fifth out of nine. The lowest four areas were significantly lower than the top five areas. Among the top five, only one was significantly higher than Interdisciplinary (Computer Science). This suggests that the top five areas were essentially similar as a group, with their students meeting with their advisors significantly more often than the lower four areas. This does not imply, however, that Interdisciplinary students as a group are clearly distinct from others by more frequent engagement with their advisors.

2. Research question two

The second question examined how often students have seen their advisor for specific reasons. The composite variable Intracurricular ranked first among Interdisciplinary students, followed (in order) by Academic Rules and Procedures, Extracurricular, and Study Abroad. The Noninterdisciplinary students ranked the variables in the same order. It is not surprising that students went to their advisors most

frequently for guidance about their majors' curriculum and for course planning, with these reasons addressing more immediate and short-term advising issues.

For each of the four variables, the mean responses of Interdisciplinary students were greater than those of the noninterdisciplinary, and the differences all were significant. Compared to the nine groups, the interdisciplinary students ranked second for Extracurricular (with no significant difference with any other group), and for Academic Rules and Procedures (significantly higher than one area), fourth for Intracurriculum (significantly higher than the three lowest ranking areas), and fourth for Study Abroad (significantly higher than the two lowest ranking). These comparisons show that Interdisciplinary students, as a group, tend to visit their advisors more often for the list of reasons than Noninterdisciplinary. This suggests that Interdisciplinary students make more effective use of their advisor and have a greater understanding of the purposes of advising. When compared to students in specific areas of study, Interdisciplinary students share this practice of effective use of advisor with students in several other areas that ranked high, such as Computer Science and Business Administration. Students' awareness of the range of functions of advising gives them opportunities for a greater range of learning experiences, which is characteristic of interdisciplinary education (Klein, 1997).

3. Research question three

The third question asked students how important specific advisor competencies are to them and how satisfied they are with them. Interdisciplinary students ranked the composite variable Curricular as the most important, followed by Accessible Hours, Helps Me Connect with Others, and Noncurricular. Consistent with the findings of

Research Question Two, it is not surprising that students highly value an advisor's guidance for curricular knowledge and planning more than the extra-, or noncurricular knowledge and planning. Interdisciplinary students rated the Curricular variable very high (m = 3.98, with 4 = very important on a 1 to 4 response scale), statistically significantly higher than Noninterdisciplinary students (m = 3.93).

When the nine areas of study are compared, interdisciplinary students as a group ranked third or higher for the variables Curricular, Accessible hours, and Helps Me Connect with Others, and ranked fifth for Noncurricular.

These rankings of competency importance imply that interdisciplinary students place a great importance on each of the advisor competencies. Placing high importance may be related to having high expectations for what one's advisor is able to do for students. Given the nature of interdisciplinary study, it is understandable that students in such programs need to rely on advisors to know the curriculum, help make connections, and be accessible. Somewhat of a surprise is the Interdisciplinary students' mean for the Noncurricular variable (m = 3.33) being the lowest among the four. The literature characterizes interdisciplinary study as a "navigating" experience that typically consists of extracurricular experiences (Elsley, 2002).

Regarding the composite variable Satisfaction with Competencies, there is no significant difference in means between the two groups of interdisciplinary and noninterdisciplinary students. Both groups' means were above the mean response of 4 ("mostly satisfied") on a scale of 1 to 5. In the comparison of the nine student groups, interdisciplinary ranked third, significantly higher than the lowest ranking three and significantly lower than the highest ranking group. So while the two groups' means did

not differ greatly, the interdisciplinary group placed in the upper end of the nine areas' ranking of satisfaction. With Interdisciplinary students being mostly satisfied, it suggests that their advisors are aware of the students' high expectations for advising.

4. Research question four

The fourth question asked students how important specific advisor personal characteristics are to them and how satisfied they are with them. Both Interdisciplinary and Noninterdisciplinary students ranked the characteristic Guiding as the most important variable, followed by Caring, and Keeps Me Updated. The means for Interdisciplinary are higher than Noninterdisciplinary for each variable, but only Keeps Me Updated differs significantly. In the rankings of the nine areas of study, Interdisciplinary as a group ranked fifth for Caring (significantly higher than one group, Computer Science) and fourth for both Guiding and Keeps Me Updated, with no significant differences with any of the other groups. It seems that interdisciplinary students are not much different from noninterdisciplinary students in the importance placed on, or expectations for, advisor personal characteristics. Both groups placed high importance on them.

Regarding the composite variable Student Satisfaction with personal characteristics, there was a significant difference between the means for the two groups of interdisciplinary (m = 3.96) and noninterdisciplinary (m = 3.83) students. In the comparison of the nine student groups, interdisciplinary ranked third, significantly higher than the lowest ranking three and significantly lower than the highest ranking group.

5. Research question five

The fifth question asked students how often they receive advice from specific sources. Interdisciplinary students ranked Peers/Family as its top source, followed by Advisor/Faculty, Catalog, and Staff. The Noninterdisciplinary students ranked the sources in the same order. Interdisciplinary rated each source higher than the noninterdisciplinary students rated them, but only one source was significantly different – the use of Advisor/Faculty. When all nine groups are ranked, the interdisciplinary students ranked third for the Advisor/Faculty source, and ranked fifth in each of the other three.

It is not surprising that students get advice more from peers than from advisors, since peer interaction and influence is more prevalent than advisor interaction. This ranking of peers ahead of advisors is similar to findings of studies done at other institutions (King, 2000).

6. Research question six

The sixth research question of this study asked what is the overall satisfaction of the advising experience of students in interdisciplinary programs and how their experience compares to that of other students. Interdisciplinary students (mean = 3.99) differed significantly higher than noninterdisciplinary students (mean = 3.80).

When comparing the nine groups, the interdisciplinary students ranked fourth. Four of the bottom five groups were significantly lower than the top four. Among the top four, only one was significantly higher than interdisciplinary (Computer Science). This suggests that the top four were essentially similar as a group, and distinct from the lower five.

D. SUMMARY OF FINDINGS ABOUT INTERDISCIPLINARY STUDENTS

The following observations from this study may be useful to advisors and advising administrators in undergraduate Interdisciplinary programs.

1. Interdisciplinary students visited their advisor most frequently for intracurricular concerns, i.e. choosing courses, course planning, getting into classes, and general education requirements. They valued very highly advisor knowledge in these areas, given the demand by interdisciplinary education to integrate or synthesize multiple perspectives. Implications for advising programs include the need for assuring advisor knowledge and training.

2. Interdisciplinary students find the advisor practice of helping to connect with others on campus to be more valuable than Noninterdisciplinary students at the university. Interdisciplinary educational experiences can be diverse, in terms of seminars, research, internships, and learning communities. An advisor needs not only to be knowledgeable of these experiences, but also ways to help students find them and relay accurate information (Gordon, 2002).

3. Interdisciplinary students find the advisor personal characteristic of Guiding to be highly valuable, which includes assisting with plans and decision making.

4. Interdisciplinary students receive advice from friends/peers and family more than any other source. This relates to item two above—the need to make connections. Moreover, they use advisors and other faculty for guidance significantly more than Noninterdisciplinary students.

E. SUMMARY OF STUDENT ENGAGEMENT WITH ADVISING

With the six research questions of this study, a total of nineteen variables were measured. Dividing the student survey respondents into two groups (Interdisciplinary and Noninterdisciplinary) showed that mean responses of the interdisciplinary students were higher than those of the Noninterdisciplinary students for eighteen variables, and significantly different for twelve of those variables. For the lone variable for which interdisciplinary students' mean was lower, there was no significant difference.

From these findings, can one conclude that Interdisciplinary students are significantly more engaged with advising than others—that they meet with their advisors more often, meet for more reasons, find advising more important, are more satisfied, and use alternative sources of advising more often? Not necessarily, since the student respondents were also divided into nine areas of study, comparing Interdisciplinary students with the eight other areas. The comparisons of mean responses among the nine areas showed that Interdisciplinary students ranked no lower than fifth for any of the nineteen variables. Its ranking were: first (once), second (twice), third (five times), fourth (five times), and fifth (six times). These comparisons of areas make it less conclusive that Interdisciplinary students are more significantly engaged with advising than Noninterdisciplinary students.

Since Interdisciplinary students were significantly different from Noninterdisciplinary in a two-group comparison, but ranged from first to fifth in the nine-group comparison, this was probably due to the Noninterdisciplinary group of eight areas of study having a wide range of survey responses. For instance, the rankings of the eight areas show that several areas of study tended to rank high for many of the variables.

These include Business Administration, Computer Science, and the Natural & Physical Sciences. The other areas of study, such as Engineering, Humanities, and Social Sciences, tended to rank low for many variables, making Noninterdisciplinary mean responses to be comparatively lower than Interdisciplinary for eighteen variables. These tendencies are likely to be dependent on the advising conditions in those areas of study. One cannot make generalizations about advising in these areas beyond this university.

Moreover, since this study used data from one university, one cannot conclude that a variable such as "areas of study" will determine the extent of a student's engagement in academic advising at other institutions. If, for example, Engineering and Humanities students at this university had relatively low advisor engagement, it cannot be said that Engineering and Humanities students at a different university will have the same low engagement. Since advising is a highly complex institutional operation (Hanson & Raney, 1993), other variables are likely to influence engagement between one institution and another. For instance, the model of advising delivery for Engineering at one university may differ from the model used for Engineering at another university. The difference in the models may result in differences in the quality of advising between the two Engineering programs.

F. DISCUSSION OF IMPLICATIONS FOR ADVISING IN INTERDISCIPLINARY STUDY

The following discussion explores issues emerging from the findings of this study. It also lists recommendations for further study to assist advisors and administrators of interdisciplinary programs who wish to positively affect student success and retention and to enhance the educational experience of their undergraduate students.

1. Interdisciplinary students

The data collected are based on students' perceptions. If students in interdisciplinary programs perceive advising (including its purpose and effectiveness) are seen to be different from students in noninterdisciplinary areas of study, what has created those differences? The answer may include two factors: the type of student who chooses to be in interdisciplinary programs, and the extent to which they understand the nature of interdisciplinary study.

Advising relates to both factors, since students are typically guided in some way into these programs. The promotion of interdisciplinary programs needs to capture the attention of students whose interests appear not to fit any of the defined traditional disciplinary areas. Program advisors need to communicate to students what it means to be in a curriculum requiring them to cross disciplinary boundaries and to fulfill complex learning objectives. Students need to understand the challenges of such programs and to be confident they can succeed. To understand further the student experience in interdisciplinary study, tt may be useful for programs, or institutions, to research the types of students who choose these programs. Might there be certain student characteristics shared by students who are drawn to these programs, and are there characteristics that are consistent with success—indicators of students with strong potential?

Students need to know the differences between interdisciplinary programs and the traditional disciplinary programs. Does this understanding create certain expectations from students for the kind of advising they receive? Even for institutions that have

established and well-defined “integrative study” programs, advising is a position to play a key role. Students need to know the important roles of certain educational interdisciplinary experiences, such as integrative capstone courses, research, internships. Do students seek out this information and have an awareness of their importance?

Research on the perceptions of students in integrative programs would be a valuable addition to the literature on advising.

2. Interdisciplinary program advisors

With regard to advisors, issues related to engagement with students include the selection of type of advisor and advising program model, as well as training, and engagement with students.

As observed in the fourth chapter, advising delivery models have a significant influence on the quality of students’ advising experiences. Miville and Sedlacek (1995) found that students respond differently to faculty advisors than to professional staff advisors (and visit them more). Pardee (2000) writes that advising programs cannot be developed, assessed, and improved upon without considering its organizational context. Advising models are based on the needs of students.

Interdisciplinary advising model options include the use of advisors who are specialists and generalists. Specialists tend to be faculty or staff members whose domain of expertise may be in one discipline, and have a deep but narrow understanding of the integrative qualities of the undergraduate curriculum. In contrast, generalists, as faculty or staff, tend to have a broader perspective. Gordon (2002) writes that “…a generalist’s knowledge of curriculum is essential in interdisciplinary advising since it cuts across

many disciplines' diverse concepts and ideas" (p. 244). Professional staff advisors (who are not faculty) tend to be generalists. Gordon finds that professional advisors in interdisciplinary programs "…are often free from the confines of specific disciplines and are knowledgeable about how information and teaching methods may connect one department's offerings with another's" (p. 240). Viewing student survey responses by advisor model may reveal further the effects of models on advising engagement with students.

The training of advisors is also important. Advisors need to know the full extent of the roles they play for students (and this applies not just for advising in interdisciplinary programs but for all academic department advising programs). Saying that students need to know the nature of interdisciplinary education means that advisors should be aware of this need and communicate it to the students. Training can result in well-informed advisors who have the potential to have a rich engagement with students, and one that is intentional and integral to the undergraduate experience.

A recommendation for further study is to research the effectiveness of advising model types on interdisciplinary students, and gather information from the advisors on their perceptions about advising, on such issues as training and support.

G. SUMMARY OF RECOMMENDATIONS FOR FUTURE RESEARCH

The following recommendations are presented for learning more about students' engagement in academic advising in interdisciplinary programs.

1. Examine what kinds of students seek enrollment into interdisciplinary. Is there a well-defined profile of such students, one that identifies their interests, goals, strengths

and weaknesses, that can inform advisors in the most effective ways of guiding them? Do program selection criteria for admission target specific types of students?

2. Use additional methods of data collection to learn more about student engagement. Since this study was limited to the use of survey data from previous institutional research, other methods (taken from the literature on assessment) include: student focus groups and interviews with individual students. Along with new methods, one can use new research questions that may be more specific to interdisciplinary study. Questions may address students' awareness of specific learning outcomes and experiences.

3. Research students' overall experience in interdisciplinary programs, not just engagement with advising. As Gordon (2002) notes, "Students who participate in these programs need to take responsibility for assessing how they personally benefited or did not profit from the experience. Advising sessions are a natural place for this to occur" (p. 254). Knowing how students are experiencing the program (e.g. their transition into the program, their coursework, and their extracurricular experiences) can help advisors in their guidance.

4. Examine student engagement in academic advising at institutions that have more formally structured "integrative studies" programs. As mentioned in Chapter One above, some programs have faculty advising committees (Smith & McCann, 2001). How would the student experiences compare, and what would be learned from the differences?

5. Examine advisor perceptions of the advising process. To what extent are they knowledgeable of student needs? Do they have the necessary resources and support to make an effective impact on student success?

s

APPENDIXES

APPENDIX A. ITEMS FROM UNIVERSITY SURVEY

The following are the questions used in the university's Undergraduate Student Survey of Academic Advising. A copy of the survey as it appeared on the website would reveal the identity of the institution, so the questions are reproduced here as shown.

1. Please enter your [computer account] ID.

2. What is your primary college or unit?
   [options deleted here since their names may reveal the identity of the institution]

3. What is your class year?
   __ first-year
   __ second-year
   __ third-year
   __ fourth-year
   __ fifth-year and above

4. About how many times did you visit your advisor this past year?
   __ zero
   __ once
   __ twice
   __ three times
   __ four or more times

5. Considering this past year, indicate how available your academic advisor has been to meet with you (either during walk-in office hours or by appointment).
   __ always
   __ usually
   __ sometimes
   __ seldom
   __ never

6. How often have you been in contact with your academic advisor this year through each of the following methods? (reply for each answer: often, sometimes, rarely, or never)

mandatory appointments
voluntary appointments
stopping in during walk-in office hours
mandatory group sessions
voluntary group sessions
required class or seminar
email
postings or mailings
other

7. If you used another method (as indicated in the last line item), please describe here.

8. How often have you seen an academic advisor this year for each of the following topics? (reply for each answer: frequently, occasionally, rarely, or never)

choosing specific courses
long-range course (curriculum planning)
for help getting into certain classes
general education requirements
academic rules, policies, procedures
learn about your field of study
tips for improving study skills
career goals or plans
graduate or professional school
getting referrals to other people for help
personal advice
seeking admission into another college or department
experiential learning (internships, research, co-ops)
study abroad

9. Students often receive advice from more than one source. How often did you seek guidance from each of these sources this year? (reply for each answer: frequently, occasionally, rarely, or never)

academic advisor
other faculty members/instructors
friends/peers
family members
Career Center staff
Academic Development staff
Counseling/Psychological Services
Student Affairs/Residence Life staff
athletic team coaches
undergraduate catalog

10. Rate the importance of these practices of your primary academic advisor, and rate your current satisfaction with these practices. (reply for each answer: very important, somewhat important, not very important, not important at all; completely satisfied, mostly satisfied, equally satisfied and unsatisfied, mostly unsatisfied, completely unsatisfied)

has accessible office hours
is responsive to emails/phone calls
is knowledgeable of major's curriculum
is knowledgeable of general education requirements
is knowledgeable of other academic programs
knows how to find accurate information
helps me connect with other people

11. Rate the importance of these characteristics of your primary academic advisor, and rate your current satisfaction with these characteristics. (reply for each answer: very important, somewhat important, not very important, not important at all; completely satisfied, mostly satisfied, equally satisfied and unsatisfied, mostly unsatisfied, completely unsatisfied)

is friendly and approachable
gives me as much time as I need when we meet
takes initiative to contact me
takes personal interest in me and my personal interests, abilities and needs
keeps me updated on my academic progress
assists me with long-term educational plans
helps me make important educational decisions

12. The following are certain student characteristics. Which items describe you? (check each answer with either Yes or No)

    a student who is still unsure about choice of major
    a student athlete
    a student with a physical disability
    a student with a learning disability
    a minority student
    a student who has studied abroad
    an international student
    a transfer student (from another institution)
    a student who has made the Dean's List
    a student who has been on academic probation

13. How would you describe the overall quality of this year's academic advising experience?

    excellent
    good
    fair
    disappointing
    poor

14. Any additional comments and/or recommendations for academic advising at [institution deleted]?

APPENDIX B. TABLES

Table B1: Rotated Factor Matrix for Reasons Students Visit Their Advisors.

	Factor	
Reasons for Visiting Advisor	1	2
Choosing Courses	.190	.747
Course Planning	.291	.704
Getting into Classes	.284	.531
General Education Requirements	.267	.674
Academic Rules & Policies	.406	.405
Learn About Field of Study	.637	.366
Study Skills	.601	.225
Career Goals or Plans	.745	.270
Graduate or Professional School	.646	.188
Getting Referrals	.664	.284
Personal Advice	.642	.248
Admission into Another Unit	.401	.254
Experiential Learning	.651	.216
Study Abroad	.382	.211

Notes. Extraction method: Principle Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in three iterations. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is .924. The Eigenvalue for factor one is 5.960 and for factor two is 1.346. The percentage of variance explained by both factors is 52.19%. Cronbach's alpha = .894

Table B2: Rotated Factor Matrix for Level of Importance of Advisor Competencies

	Factor	
Competencies	1	2
Accessible Hours	.181	.248
Responsive	.077	.520
Knowledge of Curriculum	.185	.533
Knowledge of General Education	.407	.278
Knowledge of Other Programs	.788	.093
Knows How to Find Information	.330	.455
Helps Connect with Others	.341	.268

Notes. Extraction method: Principle Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in three iterations. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is .743. The Eigenvalue for factor one is 2.312 and for factor two is 1.006.The percentage of variance explained by both factors is 47.40%.
Cronbach's Alpha = .633

Table B3: Rotated Factor Matrix for Level of Satisfaction with Advisor Competencies

Competencies	Factor
Accessible Hours	.699
Responsive	.652
Knowledge of Curriculum	.794
Knowledge of General Education	.811
Knowledge of Other Programs	.780
Knows How to Find Information	.846
Helps Connect with Others	.721

Notes. Extraction method: Principle Axis Factoring.
Rotation Method: Varimax withKaiser Normalization.
Rotation converged in three iterations. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is .903. The Eigenvalue is 4.56. The percentage of variance explained by both factors is 74.05%.
Cronbach's Alpha = .903

Table B4: Rotated Factor Matrix for Level of Importance of Advisor Personal Characteristics

	Factor	
Advisor personal characteristics	1	2
Is Friendly and Approachable	.428	.113
Gives Me Enough Time	.460	.236
Takes Initiative to Contact Me	.638	.234
Takes Personal Interest in Me	.626	.248
Keeps Me Updated	.408	.407
Assists Me with Plans	.209	.760
Helps Me Make Decisions	.252	.609

Notes. Extraction method: Principle Axis Factoring. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in three iterations. The Kaiser-Meyer-Olkin Measureof Sampling Adequacy is .805. The Eigenvalue for factor one is 2.903 and for factor two is 1.004. The percentage of variance explained by both factors is 55.83 %. Cronbach's Alpha = .762

Table B5: Rotated Factor Matrix for Level of Satisfaction of Advisor Personal Characteristics

	Factor
Advisor personal characteristics	1
Is Friendly and Approachable	.704
Gives Me Enough Time	.698
Takes Initiative to Contact Me	.787
Takes Personal Interest in Me	.846
Keeps Me Updated	.799
Assists Me with Plans	.855
Helps Me Make Decisions	.856

Notes. Extraction method: Principle Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in three iterations. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is .908. The Eigenvalue is 4.78.
The percentage of variance explained by both factors is 78.52 %.
Cronbach's Alpha = .922

Table B6: Rotated Factor Matrix for the Sources of Advising

	Factor		
Advising sources	1	2	3
Academic Advisor	.096	.086	.520
Other Faculty Members	.113	.180	.495
Peers/Friends	-.066	.785	.150
Family Members	.124	.404	.217
Career Center Staff	.400	.111	.204
Academic Development Staff	.561	.101	.115
Counseling/Psych. Services	.474	.007	.071
Student Affairs	.566	.083	.143
Athletic Coaches	.405	.074	-.018
Undergraduate Catalog	.076	.155	.016

Notes. Extraction method: Principle Axis Factoring. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in five iterations. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is .720. The Eigenvalue for factor one is 2.32, for factor two is 1.41, and for factor three is 1.044. The percentage of variance explained by both factors is 47.79 %.
Cronbach's Alpha = .622

Table B7: Ranking of Mean Number of Visits by Area of Study

Area of study	n	Mean	SD	Difference in means**	Sig.***
Computer Science	283	2.99*	1.016	-.325	.035
Business Administration	201	2.93	1.149	-.261	.300
Natural & Physical Sciences	292	2.79	1.144	-.123	.950
Undecided	116	2.67	1.291	-.008	1.000
Interdisciplinary programs	268	2.66	1.164		
Fine Arts	337	2.22*	1.313	.448	.000
Social Sciences	180	2.12*	1.381	.542	.000
Engineering	702	1.70*	1.140	.965	.000
Humanities	63	1.67*	1.257	.998	.000
Overall	2442	2.33	1.286		

Notes. Response options based on the following: 4 = four or more times, 3 = three times, 2 = two times, 1 = once, 0 = zero times.
$F(8, 2433) = 54.96$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B8: Ranking of Mean Responses for the Variable Intracurriculum

Area of study	n	Mean	SD	Difference in means**	Sig.***
Business Administration	201	2.63	.798	-.214	.077
Natural & Physical Sciences	291	2.49	.747	-.082	.944
Computer Science	283	2.42	.757	-.012	1.000
Interdisciplinary Programs	268	2.41	.751		
Undecided	116	2.35	.866	.059	.999
Fine Arts	337	2.21	.806	.194	.057
Social Sciences	179	2.17*	.829	.244	.031
Engineering	703	2.04*	.751	.370	.000
Humanities	63	2.02*	.814	.389	.010
Overall	2441	2.28	.800		

Notes. Response options based on the following: 4 = often, 3 = sometimes, 2 = rarely, 1 = never.
$F(8, 2432) = 19.946$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B9: Ranking of Mean Responses for the Variable Extracurriculum

Area of study	n	Mean	SD	Difference in means**	Sig.***
Natural & physical sciences	286	1.85	.759	-.154	.142
Interdisciplinary programs	267	1.70	.656	-	-
Business Administration	199	1.67	.666	.029	1.000
Computer Science	283	1.66	.697	.040	.999
Social Sciences	178	1.58	.699	.114	.695
Fine arts	336	1.55	.663	.142	.181
Humanities	63	1.50	.661	.085	.994
Engineering	701	1.46	.626	.124	.386
Undecided	116	1.41	.508	.169	.451
Overall	2429	1.59	.676		

Notes. Response options based on the following: 4 = often, 3 = sometimes, 2 = rarely, 1 = never.
F(8, 2420) = 11.818
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B10: Ranking of Mean Responses for the Variable Academic Rules and Procedures

	n	Mean	SD	Difference in means**	Sig.***
Business Administration	198	1.86	1.011	-.07	.996
Interdisciplinary Programs	265	1.79	.887	-	-
Computer Science	283	1.75	.976	.04	1.000
Fine Arts	335	1.67	.913	.12	.761
Undecided	116	1.65	.877	.15	.874
Natural & Physical Sciences	285	1.63	.889	.16	.474
Social Sciences	179	1.60	.851	.19	.380
Engineering	697	1.57*	.855	.22	.017
Humanities	63	1.51	.801	.28	.367
Overall	2421	1.66	.902		

Notes. Response options based on the following: 4 = often, 3 = sometimes, 2 = rarely, 1 = never.
$F(8, 2412) = 3.619$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B11: Ranking of Mean Responses for the Variable Admission into another Unit

	n	Mean	SD	Difference in means**	Sig.***
Undecided	115	1.83*	1.062	-.37	.001
Interdisciplinary Programs	266	1.45	.806		
Business Administration	197	1.44	.771	.01	1.000
Fine Arts	335	1.43	.797	.02	1.000
Natural & Physical Sciences	284	1.42	.834	.04	1.000
Social Sciences	178	1.35	.730	.11	.885
Computer Science	282	1.32	.739	.13	.534
Engineering	696	1.29	.678	.16	.078
Humanities	62	1.26	.651	.20	.671
Overall	2415	1.39	.776		

Notes. Response options based on the following: 4 = often, 3 = sometimes, 2 = rarely, 1 = never.
$F(8, 2412) = 3.619$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B12: Ranking of Mean Responses for the Variable Study Abroad

	n	Mean	SD	Difference in means**	Sig.***
Business Administration	195	1.67*	.983	-.23	.022
Fine Arts	335	1.61	.909	-.17	.104
Humanities	61	1.46	.976	-.02	1.000
Interdisciplinary Programs	264	1.44	.792	-	-
Social Sciences	177	1.38	.804	.06	.997
Natural & Physical Sciences	284	1.35	.768	.08	.919
Undecided	113	1.25	.634	.19	.346
Engineering	693	1.16*	.909	.28	.000
Computer Science	282	1.18*	.550	.26	.001
Overall	2404	1.35	.749		

Notes. Response options based on the following: 4 = often, 3 = sometimes, 2 = rarely, 1 = never.
$F(8, 2395) = 18.762$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B13: Ranking of Mean Responses for the Variable Intracurricular

	n	Mean	SD	Difference in means**	Sig.***
Computer Science	269	4.04	.337	-.061	.842
Natural & Physical Sciences	269	4.03	.361	-.054	.036
Interdisciplinary Programs	260	3.98	.365		
Fine Arts	317	3.95	.395	.030	.994
Business Administration	188	3.92	.377	.060	.040
Social Sciences	161	3.88	.408	.100	.041
Undecided	106	3.88	.473	.098	.047
Engineering	644	3.86*	.453	.121	.002
Humanities	56	3.82	.480	.161	.163
Overall	2270	3.93	.417		

Notes. Response options based on the following: 4 = very important, 3 = somewhat important, 2 = a little important, 1 = not important.
$F(8, 2261) = 8.474$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B14: Ranking of Mean Responses for the Variable Accessible Hours

	n	Mean	SD	Difference in means**	Sig.***
Business Administration	188	3.80	.658	-.19	.169
Undecided	107	3.65	.453	-.05	1.000
Interdisciplinary Programs	260	3.61	.669		
Fine Arts	317	3.59	.653	.02	1.00
Computer Science	270	3.57	.658	.04	.999
Humanities	56	3.46	.687	.14	.933
Social Sciences	164	3.44	.823	.17	.372
Natural & Physical Sciences	269	3.38*	.823	.23	.014
Engineering	647	3.29*	.882	.32	.000
Overall	2278	3.48	.767		

Notes. Response options based on the following: 4 = very important, 3 = somewhat important, 2 = a little important, 1 = not important.
$F(8, 2269) = 13.186$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B15: Ranking of Mean Responses for the Variable Helps Me Connect with Others

	n	Mean	SD	Difference in means**	Sig.***
Interdisciplinary Programs	259	3.39	.772		
Natural & Physical Sciences	267	3.31	.764	.08	.974
Fine Arts	317	3.30	.816	.09	.928
Social Sciences	161	3.29	.878	.10	.995
Humanities	56	3.29	.780	.10	.995
Business Administration	186	3.28	.804	.11	.898
Undecided	105	3.24	.966	.15	.805
Engineering	639	3.20*	.848	.19	.036
Computer Science	267	3.12*	.783	.27	.006
Overall	2257	3.26	.823		

Notes. Response options based on the following: 4 = very important, 3 = somewhat important, 2 = a little important, 1 = not important.
$F(8, 2248) = 2.498$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B16: Ranking of Mean Responses for the Variable Noncurriculum

	n	Mean	SD	Difference in means**	Sig.***
Undecided	107	3.55*	.543	-.220	.027
Business Administration	187	3.37	.538	-.048	.995
Natural & Physical Sciences	267	3.37	.591	-.042	.996
Computer Science	269	3.36	.495	-.030	1.000
Interdisciplinary Programs	260	3.33	.606		
Fine Arts	317	3.33	.575	-.006	1.000
Engineering	643	3.30	.601	.026	1.000
Social Sciences	162	3.27	.613	.055	.996
Humanities	56	3.21	.601	.122	.888
Overall	2268	3.34	.580		

Notes. Response options based on the following: 4 = very important, 3 = somewhat important, 2 = a little important, 1 = not important.
$F(8, 2259) = 2.943$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B17: Ranking of Mean Responses for the Variable Satisfaction with Competencies

	n	Mean	SD	Difference in means**	Sig.***
Computer Science	270	4.58*	.525	-.480	.000
Natural & Physical Sciences	269	4.28	.726	-.182	.183
Interdisciplinary Programs	260	4.10	.751		
Business Administration	187	4.08	.685	.022	1.000
Fine Arts	316	4.03	.798	.072	.977
Undecided	106	4.02	.705	.081	.109
Engineering	631	3.75*	.913	.351	.000
Social Sciences	160	3.73*	.919	.364	.000
Humanities	55	3.62*	1.180	.483	.002
Overall	2254	4.03	.845		

Notes. Response options based on the following: 1 = completely dissatisfied, 2 = mostly dissatisfied, 3 = equally satisfied and dissatisfied, 4 = mostly satisfied, 5 = completely satisfied.
$F(8, 2245) = 33.884$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B18: Ranking of Mean Responses for the Variable Caring

	n	Mean	SD	Difference in means**	Sig.***
Humanities	58	3.50	.444	-.056	.997
Undecided	105	3.50	.497	-.054	.990
Natural & Physical Sciences	270	3.50	.448	-.051	.956
Business Administration	188	3.47	.456	-.027	1.000
Interdisciplinary Programs	259	3.44	.502		
Social Sciences	160	3.43	.483	.011	1.000
Fine Arts	316	3.42	.467	.022	1.000
Engineering	641	3.33	.535	.110	.059
Computer science	266	3.29*	.469	.157	.007
Overall	2263	3.40	.495		

Notes. * Response options based on the following: 4 = very important, 3 = somewhat important, 2 = a little important, 1 = not important.
$F(8, 2254) = 6.242$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B19: Ranking of Mean Responses for the Variable Guiding

	n	Mean	SD	Difference in means**	Sig.***
Natural & Physical Sciences	269	3.62	.526	-.053	.986
Humanities	58	3.58	.528	-.012	1.000
Social Sciences	160	3.57	.609	-.006	1.000
Interdisciplinary Programs	258	3.57	.546	-	-
Undecided	104	3.56	.667	.070	1.000
Business Administration	188	3.55	.595	.015	1.000
Computer Science	266	3.47	.595	.092	.721
Engineering	640	3.46	.632	.107	.293
Fine arts	315	3.43	.666	.133	.185
Overall	2258	3.51	.608		

Notes. * Response options based on the following: 4 = very important, 3 = somewhat important, 2 = a little important, 1 = not important.
$F(8, 2249) = 3.168$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B20: Ranking of Mean Responses for the Importance of Variable Keeps Me Updated

	n	Mean	SD	Difference in means**	Sig.***
Humanities	58	3.41	.859	-.07	1.000
Business Administration	188	3.35	.742	-.01	1.000
Undecided	103	3.35	.801	-.01	1.000
Interdisciplinary Programs	258	3.34	.738		
Fine Arts	315	3.22	.856	.12	.703
Computer Science	266	3.20	.783	.14	.561
Natural & Physical Sciences	269	3.19	.878	.16	.427
Social Sciences	160	3.19	.818	.15	.643
Engineering	638	3.15	.850	.19*	.038
Overall	2255	3.23	.824		

Notes. * Response options based on the following: 4 = very important, 3 = somewhat important, 2 = a little important, 1 = not important.
$F(8, 2246) = 2.741$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B21: Ranking of Mean Responses for Satisfaction with Personal Characteristics

	n	Mean	SD	Difference in means**	Sig.***
Computer Science	265	4.40*	.690	-.447	.000
Natural & Physical Sciences	269	4.13	.846	-.170	.445
Interdisciplinary Programs	259	3.96	.857	-	-
Business Administration	187	3.90	.801	.060	.999
Fine Arts	316	3.79	.914	.165	.437
Undecided	105	3.77	.939	.186	.709
Engineering	625	3.62*	.996	.335	.000
Social Sciences	160	3.45*	1.036	.510	.000
Humanities	56	3.25*	1.270	.707	.000
Overall	2242	3.85	.955		

Notes. Response options based on the following: 1 = completely dissatisfied, 2 = mostly dissatisfied, 3 = equally satisfied and dissatisfied, 4 = mostly satisfied, 5 = completely satisfied.
$F(8, 2233) = 27.915$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B22: Ranking of Mean Responses for Advisor/Faculty as Source of Advising

Area of study	n	Mean	SD	Difference in means**	Sig.***
Fine Arts	318	2.85	.695	-.047	.997
Natural & Physical Sciences	275	2.84	.731	-.043	.999
Interdisciplinary Programs	264	2.80	.705		
Business Administration	195	2.73	.745	.068	.985
Computer Science	272	2.72	.673	.075	.954
Humanities	59	2.63	.758	.172	.765
Social Sciences	172	2.60	.758	.200	.100
Undecided	109	2.58	.776	.221	.143
Engineering	668	2.42*	.707	.383	.000
Overall	2332	2.66	.735		

Notes. Response options based on the following: 4 = often, 3 = sometimes, 2 = rarely, 1 = never.
$F(8, 2323) = 16.683$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B23: Ranking of Mean Responses for Peers/Family as Source of Advising

Area of study	n	Mean	SD	Difference in means**	Sig.***
Business Administration	195	3.33	.714	-.091	.920
Undecided	109	3.29	.733	-.051	.999
Fine Arts	318	3.27	.719	-.026	1.000
Humanities	59	3.26	.779	-.020	1.000
Interdisciplinary Programs	264	3.24	.707		
Natural & Physical Sciences	274	3.22	.690	.022	1.000
Social Sciences	172	3.15	.810	.088	.944
Computer science	272	3.14	.684	.103	.775
Engineering	668	3.08	.719	.160	.059
Overall	2331	3.19	.723		

Notes. Response options based on the following: 4 = often, 3 = sometimes, 2 = rarely, 1 = never.
F(8, 2322) = 4.107
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B24: Ranking of Mean Responses for Staff as Source of Advising

	n	Mean	SD	Difference in means**	Sig.***
Business Administration	193	1.51*	.560	-.140	.022
Social Sciences	172	1.40	.501	-.035	.997
Undecided	108	1.39	.475	-.017	1.000
Engineering	666	1.37	.427	-.001	1.000
Interdisciplinary Programs	264	1.37	.427		
Humanities	59	1.34	.362	.028	1.000
Natural & Physical Sciences	271	1.34	.408	.035	.992
Computer Science	272	1.33	.426	.045	.965
Fine Arts	318	1.30	.401	.075	.507
Overall	2323	1.37	.443		

Notes. Response options based on the following: 4 = often, 3 = sometimes, 2 = rarely, 1 = never.
$F(8, 2269) = 13.186$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B25: Ranking of Mean Responses for Catalog as source of advising

Area of study	n	Mean	SD	Difference in means**	Sig.***
Undecided	107	2.91	1.112	-.23	.611
Humanities	59	2.83	.968	-.15	.985
Social Sciences	172	2.82	1.058	-.14	.905
Engineering	666	2.79	1.062	-.11	.887
Interdisciplinary Programs	264	2.68	1.016		
Natural & Physical Sciences	273	2.64	1.089	.03	1.000
Business Administration	195	2.55	1.031	.13	.929
Computer Science	272	2.38*	1.066	.30	.026
Fine Arts	317	2.11*	.979	.57	.000
Overall	2325	2.61	1.073		

Notes. Response options based on the following: 4 = often, 3 = sometimes, 2 = rarely, 1 = never.
$F(8, 2316) = 15.580$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

Table B26: Ranking of Mean Responses for Quality of Advising

Area of study	n	Mean	SD	Difference in means**	Sig.***
Computer science	269	4.63*	.730	-.64	.000
Natural & Physical Sciences	272	4.07	.964	-.08	.991
Business Administration	190	4.01	.891	-.02	1.000
Interdisciplinary Programs	262	3.99	.977		
Fine Arts	317	3.73*	1.045	.26	.045
Undecided	107	3.70	1.066	.29	.234
Engineering	662	3.48*	1.053	.50	.000
Social Sciences	165	3.47*	1.166	.52	.000
Humanities	59	3.12*	1.301	.87	.000
Overall	2303	3.82	1.703		

Notes. Response options based on the following: 4 = often, 3 = sometimes, 2 = rarely, 1 = never.
$F(8, 2294) = 41.477$
* indicates that the difference in means between each group compared to Interdisciplinary is statistically significant ($p<.05$).
** indicates difference between Interdisciplinary mean and mean of other type of program (Interdisciplinary mean – other type of program mean = mean difference).
***indicates significant difference between program means and Interdisciplinary mean, according to Tukey HSD. If value = .000, then p<.0005.

BIBLIOGRAPHY

Angelo, T. A. (1995, November). Reassessing and defining assessment in higher education. *AAHE Bulletin*.

Appleby, D. C. (2002). The teaching-advising connection. In S. F. Davis & W. Buskit, (Eds.), *The teaching of psychology: Essays in honor of Wilbert J. McKeachie and Charles L. Brewer*. Mahwah, NJ: Lawrence Erlbaum Associates.

Astin, A. W. (1977). *Four critical years.* San Francisco: Jossey-Bass.

Astin, A. W. (1991). *Assessment for excellence: the philosophy and practice of assessment and evaluation in higher education*. New York: Macmillan.

Astin, A. W. (1993). *What matters in college: Four critical years revisited.* San Francisco: Jossey-Bass.

Banta, T. W., & Associates. (2002). *Building a Scholarship of Assessment.* San Francisco: Jossey-Bass.

Banta, T. W., Hansen, M. J., Black, K. E., & Jackson, J. E. (2002). Assessing advising outcomes. *NACADA Journal, 22*(1), 5-14.

Boyer Commission on Educating Undergraduates in the Research University. (1998). *Reinventing undergraduate education: A blueprint for Americas' research universities.* Retrieved March 28, 2005, from http://naples.cc.sunysb.edu/Pres/boyer.nsf.

Bradbeer, J. (1999). Barriers to interdisciplinarity: disciplinary discourses and student learning. *Journal of Geography in Higher Education, 23*(3).

Carter, K. A., & McClellan, G. S. (2000). An overview of relevant theories and models for student affairs practice. In M. J. Barr, M. K. Desler, & Associates (Eds.), *The handbook of student affairs administration* (pp. 231-248). San Francisco: Jossey-Bass.

Chickering, A. W. (1969). *Education and identity*. San Francisco: Jossey-Bass.

Chickering, A. W. (1994). Empowering lifelong self-development. *NACADA Journal*, 14(2), 50-53.

Council for the Advancement of Standards in Higher Education (1986). *Standards and guidelines for student services/development programs*. Iowa City: American College Testing Program.

Council for the Advancement of Standards in Higher Education (2000). *Academic advising. CAS standards and guidelines.* Iowa City: American College Testing Program.

Creamer, D. G., & Creamer, E. G. (1994). Practicing developmental advising: Theoretical contexts and functional applications. *NACADA Journal*, 14(2), 17-24.

Creamer, D. G. (2000). Use of theory in academic advising. In V. N. Gordon & W. R. Habley (Eds.), *Academic advising: A comprehensive handbook* (pp. 18-34). San Francisco: Jossey-Bass.

Creamer, E. G., & Scott, D. W. (2000). Assessing individual advisor effectiveness. In V. N. Gordon & W. R. Habley (Eds.), *Academic advising: A comprehensive handbook.* San Francisco: Jossey-Bass.

Crookston, B. B. (1994). A developmental view of academic advising as teaching. *NACADA Journal, 14* (2), 5-19.

Cuseo, J. (2004). *Academic advising and student retention: Empirical connections & systemic interventions*. Retrieved February 9, 2004, 2004, from http://www.brevard.edu/fyc/listserv/remarks/cuseorentation.htm

Daller, M. L. (1997). *The use of developmental advising models by professional academic advisors*. Unpublished master's thesis, Virginia Polytechnic Institute and State University. Blacksburg, VA. Retrieved September 18, 2004 from http://scholar.lib.vt.edu/theses/available/etd-64712549711241/unrestricted/etd.pdf

Elsley, J. (2002). *Advising in interdisciplinary programs.* Paper presented at the UAOA Conference.

Ender, S. C., Winston, R. B., & Miller, T. K. (1984). Academic advising reconsidered. In R. B. Winston, T. K. Miller, S. C. Ender, T. J. Grites & Associates (Eds.), *Developmental Advising: Addressing students' educational, career, and personal needs*. San Francisco: Jossey-Bass.

Ewell, P. T. (1994). To capture the ineffable: New forms of assessment in higher education. In J. S. Stark & A. Thomas (Eds.), *Assessment and Program Evaluatio*n (pp. 39-44). Needham Heights, MA: Simon & Schuster.

Frost, S. H. (2000). Historical and philosophical foundations for academic advising. In V. N. Gordon & W. R. Habley (Eds.), *Academic advising: A comprehensive handbook.* San Francisco: Jossey-Bass.

Gaither, G., Nedwek, B. P., & Neal, J. E. (1994). *Measuring up: The promises and pitfalls of performance indicators in higher education*: The George Washington University.

Glennen, R. E., Farren, P. J., & Vowell, F. N. (1996). How advising and retention of students improves fiscal stability. *NACADA Journal, 16*, 38-41.

Gordon, V., & Habley, W. R. (Eds.). (2000). *Academic advising: a comprehensive handbook.* San Francisco: Jossey-Bass.

Gordon, V. N. (2002). Advising in interdisciplinary programs. In C. Haynes (Ed.), *Innovations in Interdisciplinary Teaching*. Westport, CT: Greenwood.

Grites, T. J. (1979). Academic advising: Getting us through the eighties. AAHE-ERIC Higher Education Research Report, no. 7. Washington, D.C.: American Association for Higher Education.

Grites, T. J., & Gordon, V. N. (2000). Developmental academic advising revisited. *NACADA Journal*, 20(1), 12-15.

Habley, W. R. (1981). *Academic advising: critical link in student retention. NASPA Journal, 28(4), 45-50.*

Habley, W. R. (1997). Organizational models and institutional advising practices. *NACADA Journal* 17(2), 39-44.

Habley, W. R. (2003). *Topics in assessing faculty advisors.* Paper presented at the NACADA Academic Advising Summer Institute, St. Charles, IL.

Habley, W.R. (2004). *The status of academic advising: Findings from the ACT Sixth National Survey*. NACADA Monograph No. 10. Manhattan, KS: National Academic Advising Association.

Habley, W. R., & Morales, R. H. (1998). Advising models: goal achievement and program effectiveness. *NACADA Journal, 18*(1), 35-41.

Hanson, G. R., & Raney, M. W. (1993). Evaluating academic advising in a multiversity setting. *NACADA Journal, 13*(1), 34-42.

Haynes, C. (Ed.). (2002). *Innovations in Interdisciplinary Teaching*. Westport, CT: Greenwood.

Hunter, M.S. and White, E.R. (2004). Could fixing academic advising fix higher education? *About Campus*, 9(1), 20-25.

King, D. (1984). Administering Advising Programs. In R. B. Winston, T. K. Miller, S. C. Ender, T. J. Grites & Associates (Eds.), *Developmental Advising: Addressing students' educational, career, and personal needs.* San Francisco: Jossey-Bass.

King, N. S. (2000). Advising students in groups. In V. N. Gordon & W. R. Habley (Eds.), *Academic advising: A comprehensive handbook.* San Francisco: Jossey-Bass.

Klein, J. T. (1990). *Interdisciplinarity: History, theory, and practice.* Detroit: Wayne State University Press.

Klein, J. T. (1996). *Crossing Boundaries: Knowledge, Disciplinarities, and Interdisciplinarities*. Charlottesville, VA: University Press of Virginia.

Klein, J. T. (1999). *Mapping Interdisciplinary Studies*. Washington, D.C.: Association of American Colleges and Universities.

Klein, J. T., & Newell, W. H. (1997). Advancing Interdisciplinary Studies. In J. G. Gaff, J. L. Ratcliff & Associates (Eds.), *Handbook of the undergraduate curriculum: A comprehensive guide to purposes, structures, practices, and change* (pp. 393-415). San Francisco: Jossey-Bass.

Laff, N. S. (1994). Reconsidering the developmental view of advising: Have we come a long way? *NACADA Journal*, 14(2), 46-49.

Lattuca, L. R. (2001). *Creating Interdisciplinarity: Interdisciplinarity research and teaching among college and university faculty*. Nashville: Vanderbilt University Press.

Light, R. J. (2001). *Making the most of college: Students speak their minds*. Cambridge: Harvard University Press.

Light, R. J. (2004). Changing advising through assessment. *NACADA Journal, 24* (1&2), 7-16.

Lowenstein, M. (2000). *Academic advising and the "logic" of the curriculum*. Retrieved April 14, 2000, from http://www.psu.edu/dus/mentor/

Lynch, M. (2000). Assessing the effectiveness of the advising program. In V. N. Gordon & W. R. Habley (Eds.), *Academic advising: A comprehensive handbook.* San Francisco: Jossey-Bass.

Marion (2003). *Review: Interdisciplinarity: Essays from the literature.* Retrieved June 4, 2003, from http://home.cfl.rr.com/marion/review.htm

McCalla-Wriggins, B. (2000). Integrating academic advising and career and life planning. In V. N. Gordon & W. R. Habley (Eds.), *Academic advising: A comprehensive handbook* (pp. 162-179). San Francisco: Jossey-Bass.

McGillin, V. A. (2000). Current issues in advising research. In V. N. Gordon & W. R. Habley (Eds.), *Academic advising: A comprehensive handbook.* San Francisco: Jossey-Bass.

McNeal, A. P., & Weaver, F. S. (2001). Interdisciplinary Education at Hampshire College: Bringing People Together Around Ideas. In B. L. Smith & J. McCann (Eds.), *Reinventing Ourselves: Interdisciplinary Education, Collaborative Learning, and Experimentation in Higher Education* (pp. 50-64). Bolton, MA: Anker.

Middendorf, J. & Pace, D. (2004). Decoding the disciplines: A model for helping students learn disciplinary ways of thinking. In D. Pace & J. Middendorf (Eds.), *Decoding the disciplines: A model for helping students learn disciplinary ways of thinking.* New Directions for Teaching and Learning, no. 98. San Francisco: Jossey-Bass.

Miller, M. A., & Alberts, B. (1994). Developmental advising: Where teaching and learning intersect. *NACADA Journal*, 14(2), 43-45.

Miville, M. L., & Sedlacek, W. E. (1995). An assessment of centralized versus faculty advising in a college of engineering. *NACADA Journal, 15*(2), 20-25.

Mortimer, K. P. & Edwards, S. R. (1990). A president's view of the 1990s. In L. Jones & F. Nowomy (Eds.), *Agenda for the New Decade*. New Directions for Higher Education, vol. 70, no. 2, San Francisco: Jossey-Bass.

Newell, W. H. (Ed.). (1996). *Interdisciplinarity: Essays from the literature*. New York: College Entrance Examination Board.

Newell, W. H. (Ed.). (2001). Powerful pedagogies. In B. L. Smith & J. McCann (Eds.), *Reinventing Ourselves: Interdisciplinary Education, Collaborative Learning, and Experimentation in Higher Education*. Bolton, MA: Anker.

O'Banion, T. (1994). An academic advising model. *NACADA Journal, 14* (2), 10-16.

Palomba, C. A., & Banta, T. W. (1999). *Assessment essentials: Planning, implementing, and improving assessment in higher education*. San Francisco, CA: Jossey-Bass.

Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students*. San Francisco: Jossey-Bass.

Reinarz, A. G. (2000). Delivering academic advising. In V. N. Gordon & W. R. Habley (Eds.), *Academic advising: A comprehensive handbook.* San Francisco: Jossey-Bass.

Reinarz, A. G., & Ehrlich, N. J. (2002). Assessment of academic advising: A cross-sectional study. *NACADA Journal, 22*(2), 50-65.

Salant, P., & Dillman, D. A. (1994). *How to conduct your own survey*. New York: John Wiley & Sons.

Smith, B. L., & J. McCann (Eds.). (2001). *Reinventing Ourselves: Interdisciplinary Education, Collaborative Learning, and Experimentation in Higher Education*. Bolton, MA: Anker.

Steele, G. E., & McDonald, M. L. (2000). Advising students in transition. In V. N. Gordon & W. R. Habley (Eds.), *Academic advising: A comprehensive handbook.* San Francisco: Jossey-Bass.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures for student attrition* (2nd ed.). Chicago: University of Chicago Press.

University of Arizona (2001, May). Progress Report of the Academic Advising Task Force, Appendix C. Retrieved July 25, 2003 from http://info-center.ccit.arizona.edu/~uge/aatf/progressrptappxc.htm

Upcraft, M. L., & Schuh, J. H. (2002). Assessment vs. research: Why we should care about the difference? *About Campus, 7*(1), 16-20.

White, E. R. (2000). Developing mission, goals, and objectives for the advising program. In V. N. Gordon & W. R. Habley (Eds.), *Academic advising: A comprehensive handbook.* San Francisco: Jossey-Bass.

Winston, R. B., Miller, T. K., Ender, S. C., Grites, T. J., & Associates (Eds.). (1984). *Developmental Advising: Addressing students' educational, career, and personal needs*. San Francisco: Jossey-Bass.

Wissoker, K. (2000). Negotiating a passage between disciplinary borders. *Chronicle of Higher Education, 46*(32), B4.