

PERCEPTIONS AND PREFERENCES FOR ADVISING STYLES AMONG ENGINEERING UNDERGRADUATE STUDENTS

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ABSTRACT

This study was designed to investigate the perceptions and preferences of academic advising styles (prescriptive or developmental) reported by undergraduate engineering students. The significance for this research is that there are no studies that have examined the current incidence and preference of advising styles for engineering undergraduate students. The high attrition rate in the engineering colleges nationally makes it critical to investigate what can be done to increase retention. We do not have evidence of female students' preferences for and perceptions of academic advising, nor do we know the preferences and perceptions of males, a more traditional group of students in engineering. The lack of awareness of academic advising preferences could be a major component in the high attrition of students in the engineering major. Moreover, increased awareness and understanding for advisors, faculty administrators and even students will befall, and in turn strengthen retention. This study will investigate the expectations and perceptions of engineering students on the Prescriptive-Developmental Advising Model. The Academic Advising Inventory instrument was completed via the Internet by 373 students. This study specifically examined the comparison between gender, classification and grade point average (GPA). Results indicated no significant gender difference of reported advising style. Both genders prefer developmental advising, but female engineering student's preference is significantly stronger. Engineering students with lower GPA's report receiving prescriptive advising, while students with a higher GPA reported receiving a developmental style of advising. The results indicated the importance to facilitate an increase in *Developmental Advising* for engineering students. Both students and faculty could benefit by providing workshops to enhance the communication between the groups. A Developmental Advising workshop for engineering faculty advisors should encourage the advisors to: 1) devise an effective plan when advising incoming freshman and students with low GPAs; and 2) understand the difficulties that women face in entering the engineering field as these difficulties may result in different needs than their male counterparts. Workshops for engineering students should include: 1) a seminar for all incoming freshman students to learn key skills to successfully navigate in the engineering college; 2) a workshop to help students (particularly women) initiate contact when communicating with faculty members who might intimidate them; and 3) skills to clarify their intellectual and personal needs. This research goal is to add a new perspective to the understanding of the advising process and may have implications for academic achievement and retention of students in engineering programs.

INTRODUCTION

Academic Advising is an important tool in the educational experience for many college students (Vianden & Barlow, 2015; Cook 2009). It has been a great vehicle for promoting intellectual and social development. Academic advising has also impacted student satisfaction, retention and graduation rates (Drake, 2011; Applyby, 2001; Crockett, 1985; Crookston, 2009, 1972; Ender, Winston, & Miller, 1984; Gordon, Habley, & Associates, 2000; Kuh, 1997; Winston, 1996). Many studies have shed light on the importance of quality academic advising at the university undergraduate level, but few have specifically looked at academic advising in engineering departments. In comparison to other programs, the attrition rate for engineering degree programs nationally is unparalleled, with statistics representing over 50 percent (Geisnger & Raj Raman, 2013 & Morning & Fleming, 1994). Levin and Wyckoff (1995) attribute much of the attrition to inappropriate educational planning through academic advising. "One of the difficulties of studying academic advising is the diversity of advising programs and attitudes" (Crockett & Crawford, 1989, p. 154). The goal of this study is to explore the advising styles as they are currently perceived and preferred by undergraduate engineering students at a mid-sized comprehensive university in the southeast.

Academic advising is an important part of a student's education. "Academic advising is a systematic process, based on student-advisor relationships, conceived to aid students in achieving academic goals, career goals, and personal goals" (Ender, Winston, & Miller, 1984, p.19; Aiken-Wisniewski, 2015). It impacts the lives of the students' as well as the institutions welfare (Baker & Griffin 2010; & Crockett, 1985). This mid-sized university defines *Academic Advising* as a collaborative process between student and advisor leading to the exchange of information that encourages the individual student to make responsible academic and career decisions. This

definition aligns with one of the two major theoretical perspectives that dominate scholarly inquires related to the different styles of advising.

Crookston (2009) reported that there are two advising styles- prescriptive advising and developmental advising. Prescriptive advising is primarily focused on formal academic matters and developmental advising reflects a concern for the student's total education (Harris, 2018, Crookston, 2009, 1972; Winston & Sandor, 1984b). **Prescriptive advising** is defined as a program-focused activity in which the advisor dispenses information to the student and monitors progress (Crookston, 2009). Prescriptive advising is a more traditional advising process, in which the advisor focuses on the requirements of academic performance and not on the development of students. The role of an advisor offering prescriptive advising is primarily that of a provider of information and de-emphasizes the role of the student in the advisement process (Harris, 2018, Appleby, 2001; Crookston, 2009, 1972; Winston & Sandor, 1984b). Lowenstein (1999) characterizes prescriptive advising as: (a) hierarchical relationship; (b) one-directional flow of information and ideas; and (c) the student as a passive recipient.

Developmental advising expands the role of the advisor and is considered the opposite of prescriptive advising (Grites, 2013, Crookston, 2009, 1972; Winston & Sandor, 1984b). Unlike the advisor role in prescriptive advising, the developmental advisor enters into collaboration with the advisee. The goal of developmental advising is to help students clarify interests, skills, attitudes, and values as they relate to the college experience and career goals (Harris, 2018, Appleby, 2001; Crookston, 2009, 1972; Lowenstein, 1999; Winston & Sandor, 1984b). Lowenstein (1999) characterizes developmental advising as: (a) dialogue; (b) two-way flow of ideas and information (while recognizing that the advisor may have specialized knowledge that the student does not); (c) question-and-answer approach and (d) the student as an active participant. Ender et al., (1984) suggested that:

Developmental academic advising is defined as a systematic process based on a close student-advisor relationship intended to aid students in achieving educational, career, and personal goals through the utilization of the full range of institutional and community resources. (p.19)

Developmental advising is believed to best serve the needs of American college students (Grites, 2013, Harris, 2018, Crockett & Crawford, 1989; Crookston, 2009, 1972; Herndon et al., 1996; Winston & Sandor, 1984b). Several researchers (Crockett & Crawford, 1989; Herndon, 1993; Herndon, Kaiser & Creamer, 1996; Winston & Sandor 1984a) have concluded that students want to retain their autonomy and decision-making freedom with a strong support system from their advisor, thus indicating that they prefer developmental advising. Developmental advising enhances students' total development by addressing their intellectual and personal needs.

Specifically focusing on engineering students, Levin and Wyckoff (1995) found that academic advising focused only on course requirements for specific engineering majors and paid little attention to individual interest, ability, or appropriateness (p.15). In a qualitative study, Good, Haplin and Haplin (2002) found that many engineering students wanted their advisors to make more of an active effort when interacting with them. Studies have found that faculty interaction outside the classroom was a significant predictor of grade point average for students (Littleton, 2001; Moore, 2000). Academic advisors provide a critical service for the development of students in an academic setting. It is important for advisors to understand students' needs and preferences to interact and communicate effectively (Harris, 2018).

Models of academic advising are countless with different models being used at universities ranging from Ivy League to small private universities. However, engineering is still a profession that male dominated profession with the Congressional Joint Economic Committee reporting that currently less than 15 percent of engineers are current women. The statics show reflect a gap that can be address at the colligate level through program retention. Retention of women in engineering programs is directly associated with effective advising. Employment of the advising model that is suited toward women will give strong support while promoting autonomy in decision making with the engineering program (Auguste, et al., 2018; Vianden, et al., 2015, Crookston, 2009; Crockett & Crawford, 1989).

Though grades are important, an academic advising model that uses a more holistic approach is more one that has proven suitable for women versus men. While prescriptive advising models focuses on advising as primarily that of a provider of information and de-emphasizes the role of the student in the advisement process (Appleby, 2001) which works for most universities whose population is predominantly independent; it may not work in all the department of those universities. Therefore, university academic programs must be willing to acknowledge the research done in other in academic advising avenues and the findings to suggest which academic advising models are successful with which population in certain university programs. Use of such

research will reduce time and effort in the incorrect academic advising models and increase the effort and retention of student with the use of the correction model in the necessary programs such as engineering. (He, 2017 & Aiken-Wisniewski, et al., 2015).

PURPOSE OF THE STUDY

The significance for this research is that there are no studies that have examined the current preference of advising styles for female students in engineering and subsequently how this compares to their male counterparts. Evidence presented has shown that female students experience academic difficulty in engineering and attain the baccalaureate degree at rates much lower than males. However, we do not have evidence of female students' preferences for and perceptions of academic advising, nor do we know the preferences and perceptions of males, a more traditional group of students in the engineering major. The purpose of this study was to examine the perceptions and preferences of academic advising reported by undergraduate engineering students. Specifically, the research examined the current perceptions and desired preferences for prescriptive or developmental advising. This study specifically examined the comparison between gender, classification and grade point average (GPA). This research has the potential to add a new perspective to the understanding of the advising process and has the implication for academic achievement and retention of students in engineering programs. In addition to engineering advisors benefiting from this study, others advantages includes enhancing awareness and understanding of advising preferences could result in increasing: (a) current advising services; (b) student willingness to interact with advisors; (c) student satisfaction; (d) retention; (e) graduation rates; and (f) future employment for all students in engineering.

Participants

The population for this study was undergraduate students ranging from freshmen to seniors enrolled in an engineering college. A total of 3,885 undergraduate engineering students were alerted via E-mail to the availability of an Internet survey. Four hundred and two (10.3%) undergraduate engineering students replied and participated in the study on-line. Of these, 29 were disqualified, either because they failed to complete the instrument on-line correctly or they submitted a duplicate entry. Of the remaining 373 usable entries, a total of 265 (71%) males participated in the study along with 108 (29%) females. Thirty-four percent of the participants were seniors, 28% were juniors, 24% were sophomores, and 14% were freshmen.

Instrument

The *Academic Advising Inventory* (AAI) was developed by Winston and Sandor (1984a) to measure the two advising styles- *prescriptive* and *developmental* advising was used in this study. *Prescriptive* advising is primarily focused on formal academic matters, and developmental advising reflects a concern for the student's total education (Crookston, 2009). The AAI is a three-part instrument that measures the level of prescriptive or developmental advising perceived by students, and the level of advising preferred. The AAI was found to have a high construct validity and reliability. The questions were derived from an eight-member panel of advising experts nationally. Reliability and validity of test items are based on studies published in the test manual for the AAI by Winston and Sandor (1984a). The alpha coefficient for the Developmental-Prescriptive Advising scale was found to be .78, as measured using Cronbach's alpha.

Part I, the Developmental-Prescriptive Advising (DPA), (items 1-14) consists of 14 pairs of statements. This section is used to measure the nature of advising that the students perceive they are experiencing with their academic advisor. Paired statements exemplifying advisory topics and concerns are presented in this section. Each pair represents two ends of a continuum between the two contrasting advising styles (Winston & Sander, 1984a). Subjects were asked to indicate where, on an eight-point continuum anchored by the two statements, they would characterize the academic advising they have received. Low scores (14 to 56) indicate that *prescriptive* advising is prevalent; while high scores (57 to 114) indicate *developmental* advising is evident between the student/advisor relationship.

Part II, the Developmental-Prescriptive Advising or the "Ideal Advisor" section is another 14-item pair of statements in which the student is asked how they view their ideal academic advisor. One of the paired statements represents developmental advising and the other prescriptive. This section measures the students' preference for a particular advising style. A score 14 to 56 implies a preference for *prescriptive* advising, while a score between 57 to 114 indicates a preference for *developmental* advising. Part III of the AAI contains demographic information: (a) gender, (b) classification, and (c) GPA.

Data will be presented of the advising style received and advising style preferred (prescriptive or developmental). The categories of comparisons are centered on gender, classification and GPA. An analysis of variance (ANOVA) and *t*-test were conducted to analyze the data. The AAI evaluated the type of advising students perceived they are currently receiving and what type of advising is preferred. Scores below 57

indicated that the engineering student reported or preferred prescriptive advising, and scores 57 and greater indicate that the student reported or preferred developmental advising (Winston & Sandor, 1984a).

FINDINGS

Gender

Looking at the type of academic advising that students reported receiving, results revealed that engineering students in this survey scored a group mean of 62.21, indicating that the students who participated in this study believe they are receiving a low developmental style of advising. When categorizing the groups by gender, the males scored a group mean of 61.05 and the females scored a higher group mean of 65.04. Both genders as a group reported receiving a developmental style of advising. The frequency results revealed that many male engineering students (60%) reported receiving a developmental style of advising. The frequency table also revealed that the majority of the female engineering students (59%) reported receiving a developmental style of advising as well. Results of the *t*-test, $t(203.57, N=373) = -1.71, p=.088$, indicated that there is no significant difference between the two groups (male, female) reported of advising style received. See Table 1.

When asked what type of advising the engineering students preferred, males and females scored a mean 89.10 and 94.35 (developmental advising) respectively. The type of advising style desired by both groups of participants rendered a score higher than what the students perceived they received from their faculty. Although both genders prefer developmental advising, a statistical analysis confirmed that female engineering students had a significantly stronger desire for a more developmental advising approach than male engineering students do. The *t*-test revealed, $t(245.59, N=373) = -3.24, p=.001$ that females scored significantly higher than males. See Table 1.

Table 1 Gender Means of Advising Style Received and Preferred

Gender	Male (N=265)		Female (N=108)		Total = 373
	Received	Preferred	Received	Preferred	
Mean	61.05	89.10	65.04	94.35	
SD	20.57	15.01	20.02	12.04	
Median	62.00	91.00	64.00	96.00	
% Pres	40.00	3.00	41.00	---	
% Dev	60.00	97.00	59.00	100.00	

Note. Results of *t*-test, $t(203.57, N=373) = -1.71, p=.088$, indicated that there is no significant difference between the two groups, both gender groups are receiving a developmental style of advising. The *t*-test also revealed, $t(245.59, N=373) = -3.24, p=.001$ that females scored significantly higher than males for a higher preference of developmental advising. Prescriptive advising is a score between 14 - 56. Developmental advising is a score between 57 - 114.

Classification

Analysis of Variance (ANOVA) was used to test whether there were any differences in advising style reported and preferred by classification (freshman, sophomore, junior and senior). Results showed that there were no differences in advising received $F(506) = 1.20, p=.306$ or advising preferred $F(270) = 1.30, p=.272$ for the different class standings (freshman to senior status).

Results from the AAI revealed that all classification groups reported receiving a developmental style of advising: Freshmen (57.84), Sophomore (61.13), Junior (63.71), and Senior (63.47). The freshman class reported receiving the lowest level of developmental advising, which could be characterized as a borderline *prescriptive* style of advising. In regard to the type of advising style preferred, all classifications preferred a developmental style: Freshmen (91.94), Sophomore (92.22), Junior (90.95), and Senior (88.68). All classifications report receiving and prefer a developmental style of advising. Refer to Table 2 for an illustration.

Table 2 Classification Means of Advising Styles Received and Preferred

Classification	Received	Preferred	N
Freshman	57.84	91.94	51
Sophomore	61.13	92.22	90
Junior	63.71	90.95	105
Senior	63.47	88.68	127
Mean Average	62.21	90.62	Total 373

Note. Prescriptive advising is a score between 14 - 56. Developmental advising is a score between 57 - 114.

Grade Point Average

Students were categorized by 1, 2, 3, and 4 where 1 = GPA between 1.0-1.9, 2 = GPA between 2.0-2.9, 3 = GPA between 3.0-3.9, and 4 = 4.0-higher. ANOVA was conducted to analyze whether the various levels of GPA were different in the advising reported and preferred. Results of the ANOVA indicated that the categories of GPA are statistically different $F(9750) = 26.46, p = .000$. Students with a GPA between 1.0-1.9 reported a (41.66) prescriptive advising style and all other categories reported receiving developmental advising. Students with GPA ranging between 2.0-2.9 and 3.0-3.9 reported receiving a mean score of 60.04 and 68.78 respectively. Students with the GPA range of 3.0-3.9 reported receiving the highest developmental mean score. Please note that one student had a GPA of 4.0, for statistical reason that student was categorized in the 3.0 group. All GPA categories preferred a developmental advising style with a total group mean score of 90.62. Results are displayed in Table 3.

Table 3 GPA Means of Advising Styles Received and Preferred

GPA	Received	Preferred	N
1.0-1.9	41.66	92.90	29
2.0-2.9	60.04	90.08	187
3.0-3.9	68.78	90.80	156
4.0	37.00	97.00	1
Mean Average	62.21	90.62	Total 373

Note. There was a significant difference in the style of academic advising received for students in the 1.0-1.9 group. Prescriptive advising is a score between 14 - 56. Developmental advising is a score between 57 - 114.

DISCUSSIONS

The focus of this study was to examine the perceptions and preferences of academic advising for undergraduate students in the engineering college. Specifically, the study examined the reported and desired preferences for prescriptive or developmental advising by gender, classification and GPA. Overall, students reported receiving a developmental approach to advising (62 on a 14-114 scale). However, students reported receiving a lower level of developmental advising than they preferred (91 on a 14-114 scale). It is important to note that a large portion of the male (40%) and female (41%) engineering students reported that they were receiving a prescriptive style of advising yet preferred a developmental style. These figures should be a forewarning to the engineering department. This data supports the findings of Good, Haplin and Haplin (2002), revealing that a large portion of students would like their advisors to make more of an active effort when interacting with them.

This study corroborated the findings of Crockett and Crawford (1989), Herndon (1993), Herndon et al. (1996) and Winston and Sandor (1984 a & b) in the fact that all students prefer a developmental style of advising over prescriptive. This study adds to the literature by expanding study participants to include engineering students. The data supported the literature, validating that both genders of students prefer an advisor who promotes a collaborative and caring relationship. A developmental advisor assumes that each student is unique; with a particular level of preparedness academically, socially and emotionally (Crookston, 2009; Ender et al., 1984; Grites & Gordon, 2000; Winston & Sandor, 1984a). Students would like their faculty academic advisor to clarify interests, skills, attitudes, and values as they relate to the college experience and future goals. Developmental advising is preferred more than prescriptive advising because there is a more equal relationship and bi-directional flow of information and ideas. The prescriptive advisor only focuses on the requirements of academic performance and not on the holistic development of students. Prescriptive advising is more of a traditional advising process that has been considered outdated (Appleby, 2001; Grites & Gordon, 2000).

SIGNIFICANCE

Results of this study found that both genders prefer developmental advising. Female engineering students reported a stronger desire for a more developmental approach from their academic advisors than male engineering students did. The undergraduate engineering female students may have a stronger desire because they are in a technical field that is traditionally dominated by men.

The freshman class reported receiving the lowest level of developmental advising, which is borderline prescriptive with a group mean score of 57.84. The freshman and sophomore classes indicated the strongest preference for developmental advising with a group mean score of 92. In a difficult and technical field such as engineering that has a national attrition rate of close to fifty percent (Geisnger & Raj Raman, 2013); a prescriptive style of advising for young underclass engineering students may be a limitation for students making that transition from high school to college.

Other interesting data revealed that the students with the lowest GPA were most likely to report receiving prescriptive advising. Students with a GPA between 1.0-1.9 reported receiving a (41.66) prescriptive advising style, while all other categories reported receiving developmental advising. Several studies have found that faculty contact outside the classroom is a significant predictor of grade point average for students (Littleton, 2001; Moore, 2000). Similarly, results from this study revealed that students in the GPA range of 3.0-3.9 category reported receiving the highest group mean score of 68.78, receiving the developmental style of advising. Alternatively a student receiving prescriptive advising with comparable GPAs may not develop the confidence and academic behaviors required to be successful in an engineering environment. Without knowing which is the predominant factor, the advising style or a lower GPA, if a student did not have a strong start and did not perceive support from the advisor, that student would arguably have more difficulty overcoming the GPA than if support were perceived. Further research is needed to flush which combination of factors would assist students, both general and engineering, to be successful with a complementary developmental or prescriptive advising model.

CONCLUSIONS

The results from this study can shed light on the current advising and preferences of undergraduate engineering students. Not fully meeting academic advising preferences could be a major component in the high attrition of students majoring in engineering. It is evident that it is important for faculty advisors in the engineering college to understand their own advising approach and the diverse needs when interacting with underclass student's gender and students with low GPAs. By studying these populations, we can gain a greater understanding of the needs of all undergraduate students in engineering which can result in faculty advisors developing more effective strategies when interacting with *all* students (Auguste, et. al. 2018; & Aiken-Wisniewski, et. al. 2015).

To facilitate the increase in developmental advising, both students and faculty could be provided workshops to enhance the communication between both groups. A developmental advising workshop for faculty advisors should encourage advisors to: 1) help students clarify interests, skills, and attitudes that will facilitate success for all groups of students as they develop a purpose and direction towards earning an engineering degree; 2) devise an effective plan when advising incoming freshman and students with low GPAs; and 3) understand the difficulties that women face in entering the engineering field as these difficulties may result in different needs than their male counterparts. Workshops for students should include: 1) a seminar for all incoming freshman students to learn key skills to successfully navigate in the engineering college; 2) a workshop to help students (particularly women) initiate contact when communicating with faculty members who might intimidate them; 3) skills to clarify their intellectual and personal needs.

Evidence presented indicated a correlation between advising methods and student performance (Thompson, 2016). Since the AAI is a self-report instrument from the perspective of the student, it would be illuminating to compare student perception to faculty perception of the advising offered. If perceptions differ, (if students perceive a prescriptive style but faculty report delivering a developmental style) a follow-up study could provide tapes of some advising sessions of developmental and prescriptive styles for student and faculty coding to determine gaps between the perceptions. Further research should be conducted to find out why students with low GPAs believe that they are receiving a prescriptive style of advising, whether the faculty are consciously advising them in a different manner, and whether a change in advisor or advising style might impact the GPA. Additional qualitative research can be conducted to focus on the students who have dropped out or transferred from the engineering major. A qualitative study should be conducted to further research why female students have a significantly stronger desire for a more developmental style of advising compared to their male counterparts. Further research should be done to investigate students of different ethnicity to reveal their preference for advising, and the advising they are currently experiencing. This research may help address the needs of students with diverse backgrounds. Minority students have traditionally had difficulties with the transition when entering technical majors such as engineering at Predominately White Institutions (Harris, 2018; Burrell & Trombley, 1983; Good, Haplin & Haplin, 2002; Hrabowski & Maton; 1995; Hrabowski, Maton & Grief, 1998; Hrabowski & Pearson, 1993; Landis, 1991; Moore, 2000; Morning & Fleming, 1994). Hopefully this research will add a new perspective to the understanding of the advising process and have implications for academic achievement and retention of all students in technical fields like engineering.

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