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Evaluation of a Dual First-year Student Advising Program

Jess Everett
Rowan University, everett@rowan.edu

Maria Perez-Colon
Rowan University, perezcolon@rowan.edu

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Dr. Jess W. Everett, Rowan University

Jess W. Everett has worked in four distinct areas: waste management operations research, contaminated site assessment and remediation, education innovation, and sustainable engineering. He has employed a wide variety of techniques, including computer modeling, laboratory experiments, field testing, and surveys. His current research focuses on energy conservation, alternative energy generation, engineering learning communities, and hybrid courses (courses with classroom and on-line aspects).

Ms. Maria Perez-Colon, Rowan University

Maria Perez-Colon is a program advisor in the Henry M. Rowan College of Engineering at Rowan University, NJ. She received her M.A. degree in Higher Education Administration from Rowan University, and B.A. in English from Rutgers University. Her master thesis focused on the effects of Engineers Without Borders service projects on the global-mindedness of student participants.

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Introduction

Dramatic enrollment growth has prompted the College of Engineering at Rowan University, a North-Eastern public university, to switch from entirely faculty-led advising to a dual system, where a professional advisor assists first-year students with course registration while faculty continue to provide career related guidance. In addition, the Introduction to Engineering course taken by all engineering first-year students is used to support the advising program. The goal of this paper is to describe the dual system and assess it using surveys and observations of the professional advisor.

Background

A recent national survey of members of the National Academic Advising Association (NACADA) can be used to get a sense of the current state of higher education academic advising in the US.[1] Mandatory advising was reported by 40.2 % of respondents. Situation specific advising was reported by 23 %, where advising is mandatory for certain students, e.g., first-year, transfer, or probationary students. Voluntary advising was reported by approximately a third. Respondents also indicated who is responsible for advising at their institution: faculty (22 %), professional advisors (31 %), or both (47 %). The primary method for assessing advising programs was student surveys.

Advising can have a significant effect on student satisfaction. In one study, advisor and instructor support were both correlated with student's self-report satisfaction of needs related to autonomy, competence, and relatedness, but at different levels.[2] Instructor support was more important for competence, while advisor support was more important to autonomy and relatedness.

According to a recent NACADA keynote address, advisors must think of themselves as intentional interaction designers.[3] Advising is moving from disseminating campus information to stimulating learning, setting expectations, and establishing goals. Intentional interactions get individual students to grow, understand their options, and want to persist at college. Opportunities exist use orientation sessions, testing and placement programs, online sessions (group or individual), and apps.

Intrusive advising can help underprepared science, technology, engineering, or mathematics (STEM) students. In one intrusive advising program, orientation meetings, multiple meetings during the first semester, and a semester long seminar significantly increased the retention of underprepared STEM students.[4] An assessment of another intrusive advising program found that each advisor-student meeting contributed an average of 13 % to the probability that a student would be retained.[5]

Advising programs should be designed to accommodate target populations. Current college students belong to the millennial generation. Advising programs for millennials should accommodate their sense of specialness, conventional motivation, optimism, and need to feel protected.[6] In the same study, the authors describe three models of advising: prescriptive, developmental, and praxis. Prescriptive advising involves knowledgeable advisors providing information about courses and registration procedures, and ensuring that students enroll in the correct courses. Developmental advising encourages a two-way relationship with the advisor and

student working together to help the student make his or her own decisions. Praxis is a hybrid of prescriptive and developmental advising. Based on their study of millennials, the authors recommended dual advising where a professional advisor provides prescriptive advice and a mentor, such as a faculty member, provides developmental support. According to Wiseman and Messitt, institutions using faculty advisors should provide specialized support.[7] Faculty report (a) advising training helps them use their teaching skills in an advising setting and (b) guidance documents provided by an advising center are important to effective advising.

Some recent advances in advising include various uses of the Internet. Online surveys can be used by faculty to identify students in need of advising.[8] Surveys can also be used by students to guide reflection that may lead to greater independence and proactive participation in school. Some colleges are using social media, such as Facebook, to improve advising.[9] Various Internet-based automatic advising systems have also been used.[10,11] The effectiveness of social media is not certain. A survey of students in undergraduate teacher education programs at the University of West Florida indicated a strong preference for learning about deadlines and other school information through email, not Facebook.[12] Students preferred to interact with their academic advisor face-to-face, followed by email, then phone. Online interaction via Skype was least preferred.

Engineering curricula are particularly challenging. Advisors can provide crucial early support to students experiencing difficulty, e.g., encouraging them to get tutoring or avoid taking too many technical courses at once.[13] Sub-optimal advising can be a significant factor leading to student attrition from engineering. When change occurs--in curricula, majors, enrollment, retention, etc.--it may be necessary for advising to change as well. DePaul University's College of Computing and Digital Media responded to less than desired retention rates by changing the advising department's name, creating programs for first-year students, and clarifying the roles of faculty and professional advisors.[14] Changes were implemented over several years.

A Dual Advising System

The recent change in advising described here, in the College of Engineering at Rowan University, was prompted by rapid enrollment growth over a relatively short period. The overall increase was dramatic, with first-year enrollment tripling from 119 to 336 between 2008 and 2014. During the same period total enrollment more than doubled from 499 to 1040. Eventual steady-state enrollment is projected to be 1500 by 2017, a tripling in less than ten years. In spite of the rapid enrollment increase, the average SAT score and high school GPA of first-year students remained constant between 2010 and 2014 (Figure 1).

Prior to Fall 2014, all students were advised entirely by faculty. Relatively small first-year classes made it possible to maintain a high faculty-to-student ratio that contributed to a high retention from first to second year. The College has maintained a first-year retention rate between 74% and 87% since it welcomed its first students in 1996. Here, first-year retention is defined as the persistence of students in the engineering program from their first to second years.

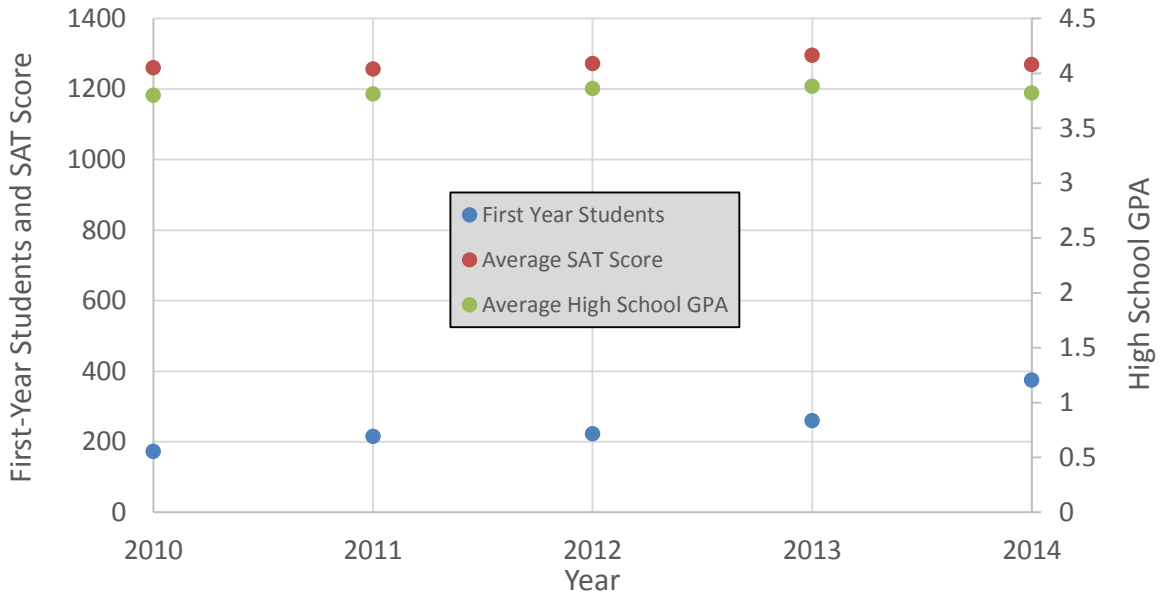

Figure 1: Change in First Year Students, 2010 to 2014.

The College recognized that one of its hallmarks--the successful integration of academic and career advising by faculty--had become difficult to sustain. The needs of first-year engineering students were of particular concern since, in addition to managing the transition from high school to college, engineering students must handle the rigors of an academically challenging program. While retention remained high, the college decided to prevent any future drop by proactively improving the advising program.

The College adopted a dual approach targeting first-year students in Fall 2014. The dual advising system consists of:

1) A first-year advisor responsible for prescriptive advising, e.g., course sequencing, college and campus policies and procedures, and identification and referral to campus resources such as tutoring, study abroad, etc.; and
2) A faculty mentor within each student's major who provides developmental advising, i.e., discipline-specific academic, industry and career related guidance.

The system also relies on online information and online exercises administered through the multidisciplinary Introduction to Engineering course taken by all first-year students. After the first year, students are advised by faculty. The advising system remains voluntary; students do not have to meet with an advisor.

Students' first contact with the first-year advisor takes place during their summer orientation program. The first-year advisor is involved in orientation planning for the college and participates in information and advising sessions during orientation. During orientation incoming students are assigned to both the first-year advisor and their discipline-specific advisor.

Various means of communication are utilized throughout the students' first semester to keep them informed about upcoming events, announcements, etc. First-year students receive broadcast emails about upcoming events in the College and workshops offered by the campus Academic Success Center on topics such as handling stress, improving study skills and time management.

The first-year advisor also maintains an advising wiki (EASE), a dedicated advising website which provides information that students can access at any time. The first-year advisor is available during regular business hours for scheduled appointments, as well as walk-ins.

In advance of the registration period for Spring classes, the first-year advisor emails students announcing the registration schedule and strongly encouraging them to meet to discuss the next sequence of courses in their major and general education requirements. Specific information about the registration process is provided including instructions, deadlines, and a listing of the next sequence of courses for their major.

Information related to advising is included in the online Ebook used in the Introduction to Engineering course taken by all first-year engineering students (Figure 2). The course is multidisciplinary; thus, each section's Ebook must contain advising and support information for all Engineering majors. Academic success strategies are also covered in this class. Furthermore, students are introduced to the Career Management Center (CMC), Engineering Outreach Office (EOO), and Academic Success Center (ASC). The office locations and website addresses of each are given.

Advising

Your Engineering Advisors are an important college resource. You have first-year and discipline-specific advisors. Your first-year advisor is __ __ (__ Hall, Room __, __@ rowan.edu, ___.___.____). The first-year advisor can help you with course sequencing, college/university policies and procedures, scheduling and campus resources. Your discipline-specific advisor is a faculty member in your Major who provides guidance related to industry-driven competencies and career information in all years, as well as scheduling after your first year. They are identified below for each major.

- Biomedical: __ __ (__@rowan.edu)
- Chemical: __ __ (__@rowan.edu)
- Civil & Environmental: All CEE faculty advise students. Your specific advisor is identified to you by email and on Banner.
- Electrical & Computer: __ __ (__@rowan.edu)
- Mechanical: __ __ (__@rowan.edu)

If you cannot find your advisor, go to your Major's secretary.

If you have questions about your schedule, you should meet the first-year advisor before registering for courses. If you make a mistake, you might end up taking summer classes to catch up or even delaying your graduation! Most majors maintain a current curriculum on the department webpage, which can be very helpful. The EASE site has an FAQ on Rowan engineering advising (and more) that many will find helpful, at advisingrowanengineering.pbworks.com. Meet with your discipline-specific advisor any time you have questions about your learning or career.

Figure 2: Advising Information Provided in Introduction to Engineering Course EBook

CMC provides career counseling. EOO provides assistance with internship and career counseling. ASC provides tutoring and disability assistance. Engineering students considering changing to a major outside of engineering are directed to CMC. Students considering a change

of major within Engineering are directed to EOO and the appropriate discipline-specific advisor. Students requiring tutoring and disability assistance are directed to ASC. Referral is typically through faculty teaching the Introduction to Engineering course or the first-year advisor.

Exercises related to advising are administered just prior to course registration via the Introduction to Engineering course's online Ebook. An example is given in Figure 3. Students receive credit toward their homework grade when they complete the exercises. The exercises prompt students to consider and evaluate their need for, and use of, campus resources related to advising and academic success. They direct them back to the Ebook to find contact information for advisors and academic success support staff.

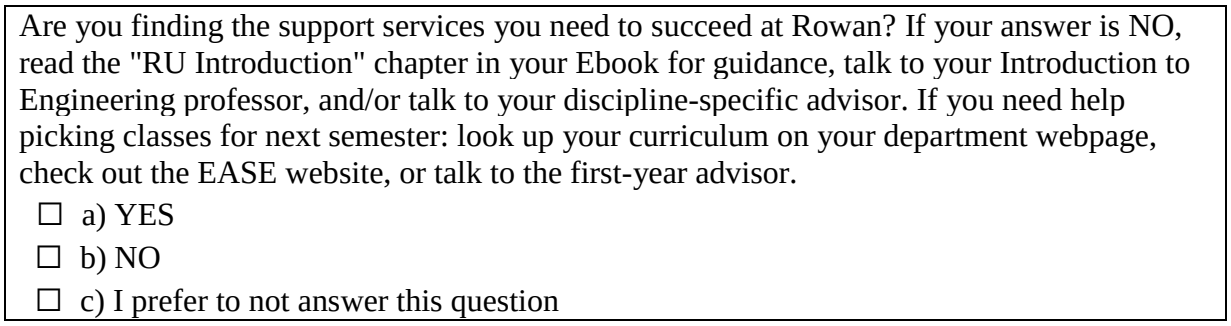

Figure 3: Online exercise directing students to find support services in course Ebook

Data Collection

Data were collected using two surveys embedded within the Ebook used in the Introduction to Engineering course. These surveys occurred mid-semester and end-of-semester. A third survey was administered at the end of the semester using SurveyMonkey. The participation rates in these student quizzes/surveys were 82, 74, and 66 %, respectively. A faculty survey was administered at the end of the semester to four of the discipline-specific advisors. The CEE major uses multiple advisors and was not surveyed.

Results and Discussion

Nearly all first-year students found the support services they needed to succeed in Fall 2014 (Table 1); however, many found one or more important support services difficult to find (Table 2), including course scheduling, academic support, seeking an internship, career guidance, and computer help.

Table 1: Did you find the support services you need to succeed at Rowan?

Answer Selected	Response Count	
	Mid-Semester	End-Semester
YES	291	261
NO	12	10
I prefer to not answer this question	7	7
No answer selected	0	0

Table 2: Which important support service(s) did you have difficulty finding? (1 = most important, 2 = Second most important, 3 = Third most important)

Answer selected	Response Count					
	Mid-Semester			End-Semester		
	1	2	3	1	2	3
I have found all the services I need	181	189	204	174	179	188
Help selecting courses for next semester	34	21	8	25	16	7
Academic support, e.g., tutoring, study skills…	24	15	9	18	10	12
Finding an internship	17	15	10	12	6	4
Career guidance	14	23	15	4	15	6
Help w/personal computer or computer network	14	12	9	17	11	3
Help dealing w/ roommates-dorm mates	6	2	2	9	1	2
Accommodation of a medical/learning disability	4	1	3	4	1	0
Other	7	9	11	7	9	12
I prefer to not answer this question	7	7	9	6	6	12
No answer selected	2	4	5	2	2	2

Students were also asked if they had all the advising information needed to stay on track academically (Table 3). Approximately 75 % believed they had enough information at mid-semester. This increased to 83 % by the end-of-semester.

Table 3: Do you have all the advising information needed to stay on track academically?

Answer selected	Response Count	
	Mid-Semester	End-Semester
YES	221	221
NO	78	47
I prefer to not answer this question	7	8
No answer selected	4	2

A number of online information sources are available to help students connect with the support services on campus (Table 4), in addition to regular emails from the first-year advisor and information in their Introduction to Engineering Ebook. The Rowan Success Network (RSN) is an early warning and student tracking system utilized by the entire campus. Information regarding a student's attendance and performance is collected by RSN, helping faculty and advisors detect at-risk students in time for early intervention. The Graduation Requirements Advising Database (GRAD) is an online registration requirements tracking tool that allows students and advisors to view academic progress at any time. GRAD interactively matches courses completed by students with their degree requirements. It provides students and advisors with an important tool for tracking student progress towards degree or award completion.

All of the resources in Table 4 were specifically identified in the Introduction to Engineering Ebook except RSN and GRAD, which will be added for Fall 2015. The link from the College of Engineering homepage to EASE will be made more prominent. It is interesting to note that the Engineering Advising Wiki was only identified by 21 students (Table 4). However, a counter embedded within the wiki page indicated over 1200 visitors during the semester. Perhaps the

Table 4: Web resources used to obtain advising-related information (Check all that apply)

Answer Options	Response Count
GRAD-Graduation Requirements Advising Database	182
University website	168
College of Engineering website	93
Online Course Catalog	77
Your specific major website (BME, ChE, CEE, ECE, ME)	53
Rowan Success Network (RSN) (advising management system)	50
Engineering Advising Wiki (EASE)	21
None of the above	11
Other	2
No answer selected	11

students did not recognize it by the name given in Table 4. Improvements can be made. That said, the effectiveness of the EASE wiki is unknown. This can be investigated in future work.

First-year students were asked about their academic performance at mid-semester and end-of-semester (Table 5). While the number of students fearing failure decreased significantly from mid-semester to end-of-semester, the number fearing a lower than desired grade did not. This suggests that a greater effort should be made to direct students to academic support services. Students who met with the first-year advisor during the semester to discuss academic difficulties in one or more subjects were encouraged to seek tutoring services, and/or disability resources, as appropriate.

Table 5: How many courses are you in danger of failing or getting a lower grade than is your goal?

Answer selected	Response Count			
	Mid-Semester		End-Semester	
	Failing	Lower Grade	Failing	Lower Grade
NONE	219	80	241	64
ONE	55	106	13	108
TWO	12	83	1	69
THREE	3	16	0	18
FOUR	0	7	1	1
FIVE	0	2	0	5
I prefer to not answer this question	18	12	20	11
No answer selected	3	4	2	2

Students reported the number of times they met or otherwise interacted with advisors and staff (Table 6). As expected, more students met with the first-year advisor than discipline-specific advisors. It appears that the new advising materials diverted some advising questions from faculty to a professional advisor. This is supported by the results of the survey of discipline-specific advisors. Two were in their first-year in the role and unable to answer. The CEE major

does not have a single discipline-specific advisor. The two advisors with sufficient experience reported substantially less workload related to advising.

A number of students obtained advising information from their Introduction to Engineering course professor. This was probably due to the convenience factor: students met with this faculty member twice a week. Furthermore, the advising exercise students completed online (Figure 3) identified their course professor as a resource. The first-year advisor will reach out to faculty in the future, providing tools to point students to advisors and support services.

Fifty-two students reported meeting with ASC staff at least once (Table 6), but two-hundred and one indicated they would get a lower than desired grade in one or more class (Table 7). Given the high number of students who had difficulty finding one or more support services (Table 4), the high number worried about getting a lower than desired grade in one or more classes, and the relatively low number meeting with ASC staff, it appears that more needs to be done. In Fall 2015, the mid-semester online advising exercise administered thru the Introduction to Engineering course will be improved. It will directly provide contact information for the first-year advisor, discipline specific advisors, CMC, EOO, and ASC. The Introduction to Engineering course faculty currently address academic success in the first week of school. Starting in Fall 2015, they will be asked to re-address this topic nearer to mid-semester and encourage students to seek help. Finally, a resource guide will be developed and handed out to first-year students and faculty teaching first-year courses. The guide will also be available online and in the Dean's, departments' and advising offices.

Table 6: How many times did you meet or have a significant communication (e.g., phone or email) with any of the following?

Answer selected	Response Count				
	First-year advisor	**Discipline-specific advisor**	**IE Professor***	**CMC Staff***	**ASC Staff***
Zero Times	74	201	221	258	221
One Time	94	40	37	10	37
Two Times	62	20	9	2	9
Three Times	27	8	1	0	1
More than Three Times	17	2	5	1	5
I prefer to not answer this question	2	5	2	4	2
No answer selected	2	2	3	3	3

*Introduction to Engineering Professor, Career Management Center Staff, or Academic Success Center staff, respectively. Only interactions with the professor that are "about important issues NOT related to the course" were to be counted by the student respondents.

Table 7 is used to show how students interacted with their advisors. As expected, email was the most common method. Group sessions represent an efficient method that will be better used in the future. Perhaps the most surprising result in Table 7 is the number of students who claimed that they wanted to interact with the discipline-specific advisor, but didn't know their name or how to contact them. This information was provided for all but one major in their introduction to engineering course Ebook and was emphasized in class. Students unable to contact their

discipline-specific advisor are broken down by major in Table 8. Over 65 % of BME majors wanted to--but could not—contact their BME advisor. Given that BME is a new major, this could be due to problems with the BME website or outreach. CEE majors were next, at almost 44 %. CEE is the only major in the college that shares advising among all faculty; thus, the Ebook did not identify a CEE advisor (Figure 2). CEE may need to consider additional outreach to its students. It is not known why almost 43 % of ECE student could not identify their ECE advisor, given that she was identified in their Introduction to Engineering course Ebook. When the Introduction to Engineering professors readdress academic success at mid-semester, they can remind student that their advisors are identified in their Ebook.

Table 7: During the course of this semester, how did you interact with…? (check all that apply)

Answer Options	Response Count	
	First-year Advisor	Discipline-Specific Advisor
I wanted to, but did not know their name or how to contact them	--	93
I chose to not interact	61	89
Email	135	29
Face to face - scheduled appointment	86	25
Face to face - walk-in	43	19
Group session	6	2
Telephone	1	0
Other	1	7
No answer selected	11	11

Table 8: Students--by major--wanting to contact their discipline-advisor, but who did not know their name or how to contact them.

Major	Total in Major (Respondents)	I wanted to*	
		Number	Percent
Biomedical Engineering	25	17	68.0
Chemical Engineering	50	17	34.0
Civil & Environmental Engineering	48	21	43.8
Electrical & Computer Engineering	61	26	42.6
Mechanical Engineering	56	12	21.4
Sum or Average	240	93	38.8

*I wanted to, but did not know their name or how to contact them

As expected, the most common reasons for meeting an advisor were assistance with scheduling/registration, selecting courses for the next term, and exploring possible minors or concentrations (Table 9). This was followed by dropping/adding a course and questions about changing a major. A significant number of students interacted with their discipline-specific advisor concerning assistance with scheduling/registration and selecting courses for the next term, two topics that should be discussed with the first-year advisor. EASE, Ebook, in-class outreach, and emails all direct students with questions in these areas to the first-year advisor.

Providing a short guide to the Introduction to Engineering faculty can ensure that they also direct students to the first-year advisor. Also, when they readdress academic success in class at mid semester, they can emphasize the role of the first-year advisor.

Table 9: Why did you INTERACT or MEET with an advisor? (check all that apply)

Answer Options	First-year Advisor		Discipline-Specific Advisor
	Interact*	Meet*	Interact
I did not interact/meet	67	113	178
Assistance with scheduling/registration	114	87	29
Selecting courses for the next term	104	82	30
Possible minors; concentrations	36	29	8
Dropping/adding a course	21	11	3
Questions about changing my major	15	11	5
Content of courses	8	5	10
Academic difficulties	5	6	1
Study abroad	6	5	2
Concerns related to professor/faculty	3	1	0
Career alternatives	2	1	2
Non-academic concerns (Personal problems, life issues, etc.)	2	2	1
Study skills or tips	0	2	2
Financial Aid	0	0	0
Other	7	8	4
No answer selected	11	11	11

*With regard to the First-year Advisor, "Interact" includes meeting and any type of communication.

Approximately 21 % of respondents indicated they did not prepare for their meeting with the first-year advisor. Advising Websites, Ebooks, in-class outreach, and direct emails should strongly encourage students to prepare for these meetings, e.g., looking at their curriculum and determining as much of their course schedule as possible before meeting.

Conclusions

A significant increase in engineering enrollment at a North-East public university prompted a proactive change in first-year advising with the goal of maintaining high retention rates. The previous system was entirely faculty staffed. In the new dual system a first-year advisor is responsible for advice on course sequencing, college and campus policies and procedures, and referral to campus resources such as tutoring, study abroad, etc. A faculty mentor within each student's major provides discipline-specific academic, industry and career related guidance. Advising information is provided in the online Ebook used in the Introduction to Engineering course taken by all first-year students. The Ebook is also used to administer exercises on advising that students complete for homework credit. The exercises prompt students to reflect on their academic performance and direct them to the Ebook to find needed contact information.

The new advising systems was successful in its first semester, as indicated by students' ability to find support services; however, improvements can be made to (a) make it easier for students to identify support organizations; (b) help students go to the proper advisor; and (c) motivate more students to seek needed academic support. To achieve these improvements, the following will be accomplished before Fall 2015:

- Improve the link between the College of Engineering Website and The Engineering Advising Wiki, EASE.
- Better describe the roles of the first-year and discipline-specific advisors for first-year students.
    - First-year: course scheduling; drop/add; minors; change of major; finding academic support.
    - Discipline-specific: understanding the major; career information.
- Introduce and emphasize the use of GRAD, RSN, and Banner during freshman orientation and in the Introduction to Engineering Ebook.
- Improve the Introduction to Engineering Ebook exercises on academic success and advising by directly pointing students to advisors and academic support organizations.
- Have Introduction to Engineering faculty readdress important academic success and advising topics mid-semester.
- Create and distribute a first-year student advising and academic success guide.

The dual advising system described here worked well in its first year and will be continued with the relatively minor changes described in this paper.

Recommendations for Other Institutions

The authors highly recommend dual advising systems. A professional advisor can provide excellent prescriptive advising. This frees faculty to invest more time in mentoring activities; thus, providing better developmental advising to students.

The authors recommend incorporating academic success and advising topics into a first-year course via readings, lectures, and reflective exercises. Professors can emphasize the importance of good study habits while simultaneously advertising and promoting advising and academic support functions on campus. Homework, online or not, can be used to encourage students to reflect on the academic progress and seek help as appropriate.

Any new advising system must be evaluated by surveying relevant students, staff, and faculty. The evaluation reported here provided a number of unexpected insights that will be used to direct future improvements.

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