

Effectiveness of Online Student Advising System within the Electrical Engineering Department at UAE University

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Abstract: Academic advising is an essential tool for fostering undergraduate students' capacity to take responsibility for their education and developing meaningful study plans that align with students' career and life objectives. In the advising process, both students and advisors play significant roles in order for students to earn their degrees on time. This paper examines the effectiveness of the advising system currently instituted in the Department of Electrical Engineering at the College of Engineering at United Arab Emirates University (UAEU). For comparison, this paper provides an overview of the former paper-based advising system, highlighting the main drawbacks of that system, while offering a brief description of the new "Degree Works" system. Next, the paper presents the methods and results of a study conducted to assess the effectiveness of the current advising system. The research involved the creation and distribution of surveys with various question types, including multiple choice, rank order, Likert-type scales, and open-ended. Both students and advisors at the UAEU department of electrical engineering were invited to complete the survey. The student feedback and advisor responses revealed important findings. Notably, the most commonly used features of Degree Works were determined to be student progress status, audit report, and GPA. Moreover, the results demonstrated that, in general, the current student advising system is well liked by both students and advisors; is effective and user friendly; and reduces advising time. The results however also indicate that the current advising system possesses certain limitations that require improvement. Consequently, the study participants suggested the addition of alert notifications and an automatic degree plan generation option to enhance the system.

Keywords: *Academic advising, Degree Works, Study planning, Advisors, Advisees.*

1. Introduction

Academic advising helps students maximize the benefits of their education and utilize their institutions' facilities to achieve their targeted educational requirements and goals. This time consuming activity in which faculty members and students interact is critical for monitoring student academic progress and coordinating degree requirements. To graduate students on time, universities must provide an array of academic supports and advising assistance as students' progress towards degree completion. According to [1] students at different stages in their academic career require different types of advising as students become more familiar with the academic system and infrastructure over their course of study. According to a University of Texas academic advising plan [2], the student-to-advisor ratio is generally high, which affects the quality of advising in many ways. For instance, a high student to advisor ratio could lead to longer wait times and loss of motivation to seek

advising. In addition, advisors may face scheduling challenges as they juggle other academic commitments like teaching and research. Such challenges may affect the quality of the advising as well.

To overcome the problems in academic advising systems, many educational institutions recommend remedial actions like improving the quality of advising by conducting advisor training, introducing electronic software for advising, and implementing rules regarding the advising schedules such that students participate in a full four or five-year study plan on a semester by semester basis and have greater access to advisors [2, 3, 4].

Electronic advising systems, like the PACE system at Georgia State University, were first introduced in early 1980s for auditing purposes in the form of student repositories [5]. Taking the advantages of an electronic advising system into consideration, researchers at the University of Wisconsin designed software for the management department [6]. This

software incorporated expert system knowledge for advising undergraduates. In a related work, [7] introduced an automatic student advising system developed in JAVA programming language to help students prepare their study plan and use the information to register for courses in UAEU's online registration system. The program stores the students study plans in a digital file as a complete 4-year study plan. Baloul's work presented at the International Conference on Computing, Electrical, and Electronic Engineering employed fuzzy logic in academic advising for probation students [8]. The system helps students determine the best course load, which can reduce the risk of stress during the semester due to course overload.

As educational institutions move toward multidisciplinary programs, student advising becomes increasingly complicated due to the introduction of free elective courses, intersecting timetable scheduling, etc. Given these complications, integrated online systems are necessary for more effective monitoring and planning. To cater to such complicated educational systems, a web-based fuzzy expert educational advisory system was introduced to avoid crisp expert knowledge in guiding the students [9]. The Oberlin College and Conservatory and New York University adopted commercial software called "AdviseStream," which gives advisors tools to manage their entire advising world in one place. AdviseStream integrates and streamlines workflows, reports, and analyses for advisors, giving them time for quality interactions with students [10].

In 2017, UAEU also launched Degree Works to enhance student advising [11]. Before implementing Degree Works, UAEU had been using a manual paper-based advising system. In view of that, this paper aims to present students' and advisers' perspectives on the effectiveness of this sophisticated web-based advising system that is used in the Department of Electrical Engineering at the College of Engineering. Section 2 offers a brief introduction of the current electronic system. Section 3 describes the study designed to identify if the new system effectively advises students in the Department of Electrical Engineering. Section 4 illustrates the research findings and highlights some of the issues flagged by the respondents. Finally, Section 5 details the study's conclusions.

2. Current Electronic System

The online electronic student academic advising system called "Degree Works" was first implemented at UAEU in August 2017 (Fall 2017). Degree Works is an advanced web-based advising product offered by Ellucian. This online system is expected to help students and their advisors successfully navigate curriculum requirements and effectively coordinate students' degree requirements. The system offers many features, including 1) the option to create semester-by-semester study plans thereby providing

the students a clear path of coursework required in a sequential order; 2) degree audit options for advisors to track and verify the progress of their advisees; 3) a summary of the courses the students have taken in a block format displaying degree, major, minor, and concentration requirement information with semester and grading details; 4) the ability to produce a "what-if" report using courses students wish to take in future semesters; and 5) a GPA calculation function.

Fig. 1 shows a part of a study plan created by a student. Unlike the old, paper-based system, the advisor can view the student's study plan anytime and conduct degree audits as illustrated in Fig. 2. The degree audit shows the full status of the student and curriculum requirements for degree completion.

Although the Degree Works system has improved the student advising process, advisors and advisees encounter additional problems. For example, students complain about incorrect academic information in audit reports and a lack of support services, while the advisors criticize the existence of repeated or multiple study plans per student and the absence of notification when students alter or add new plans. Based on this feedback, this paper attempts to gauge the effectiveness of the current student advising system at UAEU.

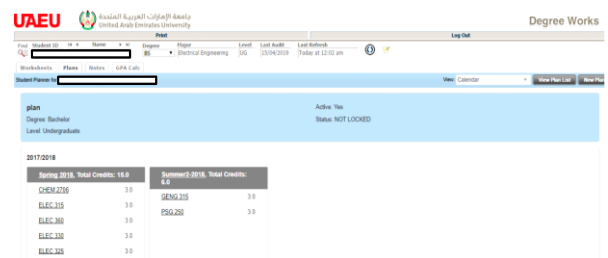


Fig. 1. A sample 2-semester study

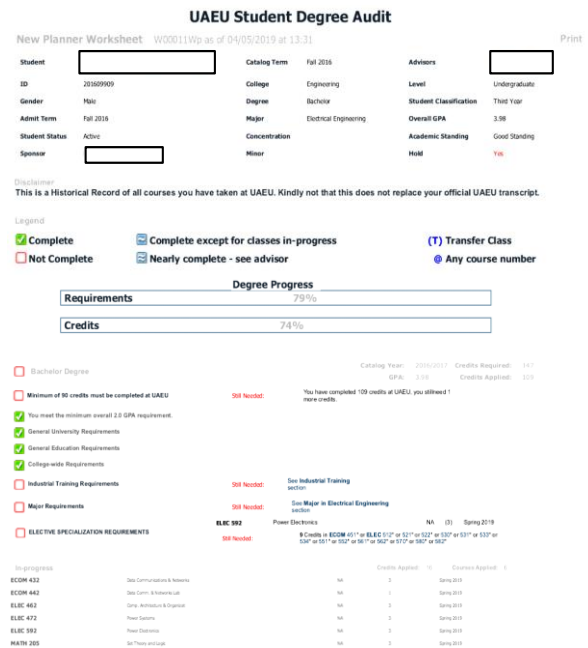


Fig. 2. A degree audit generated from the Degree Works system.

3. Research Design

As mentioned in the previous sections, this study aims to identify issues with and offer suggestions for improving the advising system for the benefit of both students and advisors in the College of Engineering at UAEU. To achieve these objectives, two data collection forms were prepared to inquire about the different perspectives of the involved parties. The survey forms were designed with multiple choice, rank order, Likert-type scales, and open-ended questions.

A. Participants

The participants of the student survey comprise of electrical engineering students from various academic years. A significant number of participating students passed the majority of their first year general courses. A predominate section of the survey questions were related to importance of degree planning and effectiveness of current advising system. The participants of the advising survey comprise of faculty members, mostly from the department of electrical engineering, who are involved in advising students. Generally, an advisor maintains a group of advisees from the time the student joins the College of Engineering until the student graduates. Each semester, new students are typically assigned to advisors to replace the graduated students. The majority of the advisor survey questions inquired about the effectiveness of the current advising system and suggestions for improving the system.

B. Data Collect

The electronic survey forms were prepared for easy data collection and analysis. These forms were sent to the students and faculty members via email. The email addresses were collected from the departmental student information system and the faculty information available on the department website. After the initial request to the participants, a few reminders were send to speed up the data collection process. Out of 200 students who received the survey, 100 responded, while all 16 advisors in the department of electrical engineering participated in the survey.

4. Research Findings And Discussions

This section reports the findings obtained from the collected surveys. More than 50% of the participants, including both advisors and students, indicated a preference for the electronic advising system over the paper-based system. The remaining participants indicated a mixed perception of the electronic advising system. On average only 16% (mostly students) indicated that they do not prefer the electronic advising system. Fig. 3 shows the participants' responses regarding use of the electronic advising system over the paper-based system.

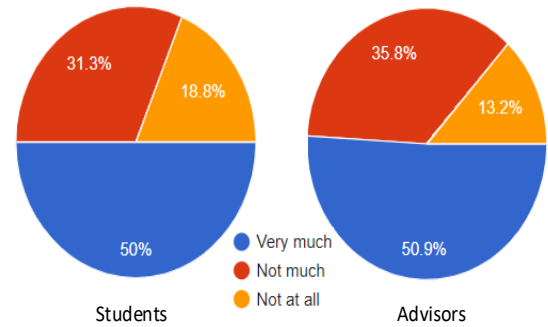


Fig. 3. Preference for the electronic advising system over the paper-based system.

Most of the advisors at the Department of Electrical Engineering indicate that they advise an acceptable number of advisees as shown in Fig. 4. However, as demonstrated in Fig. 5, advisors believe that most of the students do not understand the importance of degree planning. Thus, advisors spend a lot of time advising the students and fixing the advisees' study plans.

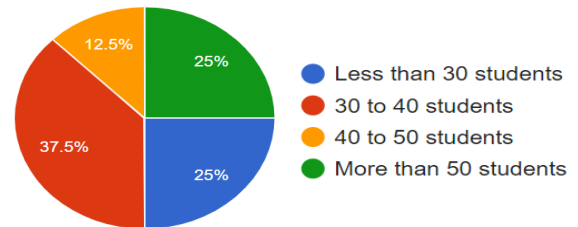


Fig. 4. Distribution of students to various advisors in the department of electrical engineering.

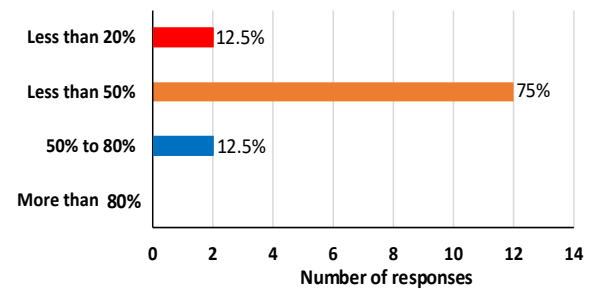


Fig. 5. Advisors' opinions regarding student perceptions of the importance of degree planning.

As shown in Fig. 5, a majority of advisors indicate that less than 50% of the students understand the importance of degree planning. This implies that students need to be made aware of the importance of degree planning. When asked about their awareness level regarding degree planning (via the question "Why do you need a proper study plan?"), students responded as demonstrated in Fig. 6. As illustrated, it is clear that the students have some understanding of the importance of degree planning, which contradicts the advisors' opinions of student perception regarding the importance of degree planning.

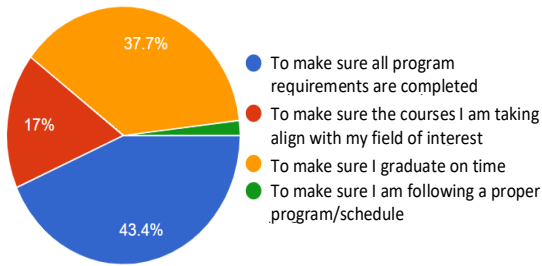


Fig. 6. Students' responses regarding the importance of proper degree planning.

As seen in Fig. 7, in order to determine how advisors and students adapted to the new advising system, the survey inquired about how frequently the participants used Degree Works. The survey revealed that most students use the system only once per semester (73.6%). This response is realistic as students typically require modifications to their study plans at the beginning of the semester depending on the courses offered during that particular semester. Similarly, a large percentage (43.8%) of the advisors indicated that they use the system only once per semester—when student meetings occur. Other than that, both students and advisors use the system as needed to check student progress and GPA.

Given its recent introduction at UAEU, it is also important to inquire about the “user-friendliness” of Degree Works. As shown in Fig. 8(a), most of the advisors and students indicated that the user guide provided was sufficient to help them use the system effectively. However, as indicated in Fig. 8(b), both the advisors and students (83% respondents) recommended that an online helpdesk would help clarify unfamiliar options and resolve problems.

Furthermore, to evaluate the effectiveness of the online advising system, the survey asked the participating students the following questions:

- 1) How effective is the "Degree Works" in preparing your full study plan?
- 2) Does the "Degree Works" system reduce your meeting sessions with your adviser?

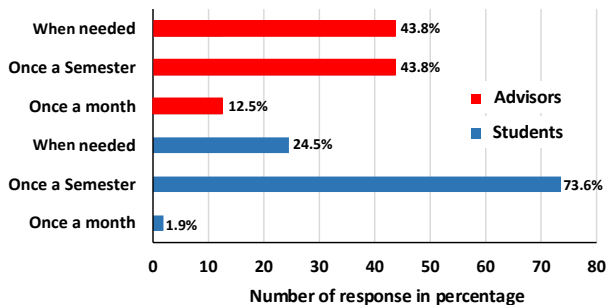


Fig. 7. Frequency of Degree Works usage.

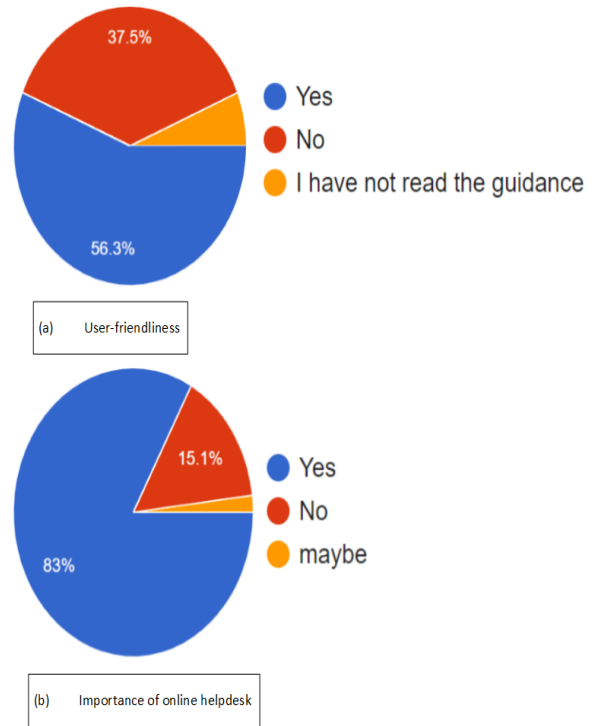


Fig. 8. User-friendliness of Degree Works system.

Fig. 9 shows the results obtained for these questions, demonstrating that the Degree Works system is perceived as being very effective for student advising and study planning. Of the student participants, 35.8% think it is very effective, while 18.9% indicated that the system is extremely effective in study planning. In addition, 71.7% of student participants stated that Degree Works helps reduce the number of advisor meeting sessions.

Although students indicated that Degree Works is a very effective system, most of the advisors responded that the students do not generally follow the advising comments posted in the advising system. As shown in Fig. 10, many of the advisors (43.8%) noted that students do not follow their advising comments in Degree Works, while a quarter of advisors (25%) believe that the students do not even check the comments provided to them.

To uncover the reason for the contradiction between student responses and advisor opinions about the effectiveness of online comments, the following questions were asked of advisors and students, respectively.

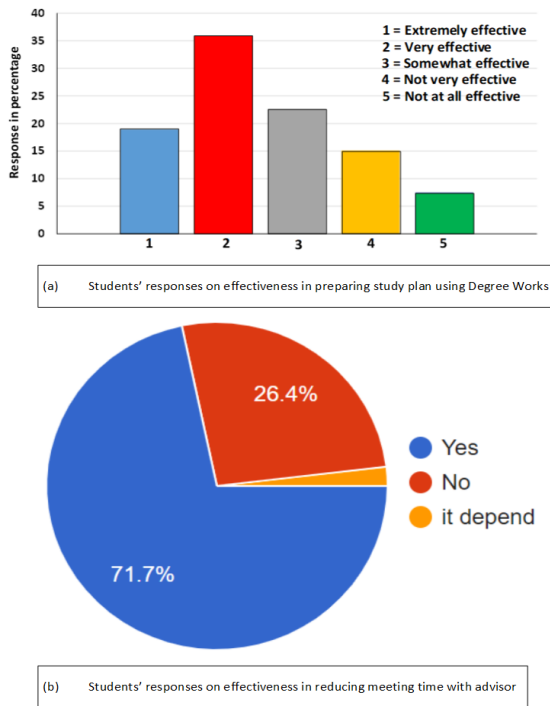


Fig. 9. Effectiveness of online advising system: Students' responses.

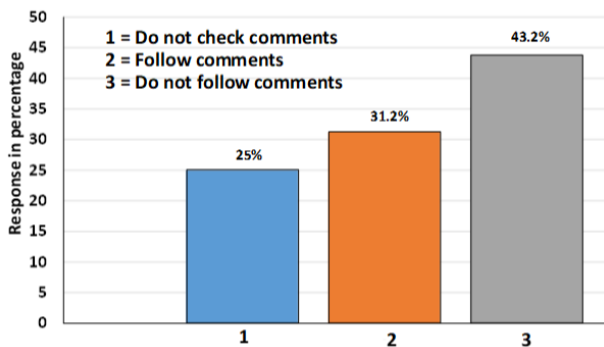


Fig. 10. Advisors' responses regarding online advising comments.

- 1) Do you get alerts when students choose courses for registration different from the approved study plans or submit multiple study plans?
- 2) Do you get alerts when your adviser approves study plans or comments on your study plan?

According to the results shown in Fig. 11, it seems that that the Degree Works alerts neither students nor advisors about important activities happening in the degree planning. This demonstrates that there is still room for improvement in the current online student advising system.

The final aspect that the surveys inquired about were the most common features both advisors and students utilized in the current student advising system. As shown in Fig. 12, the most commonly utilized features were the student progress status, student audit reports, and GPA calculator.

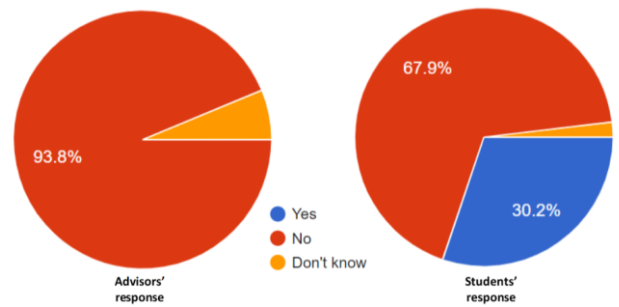


Fig. 11. Participants' responses about alerts related to advising activities.

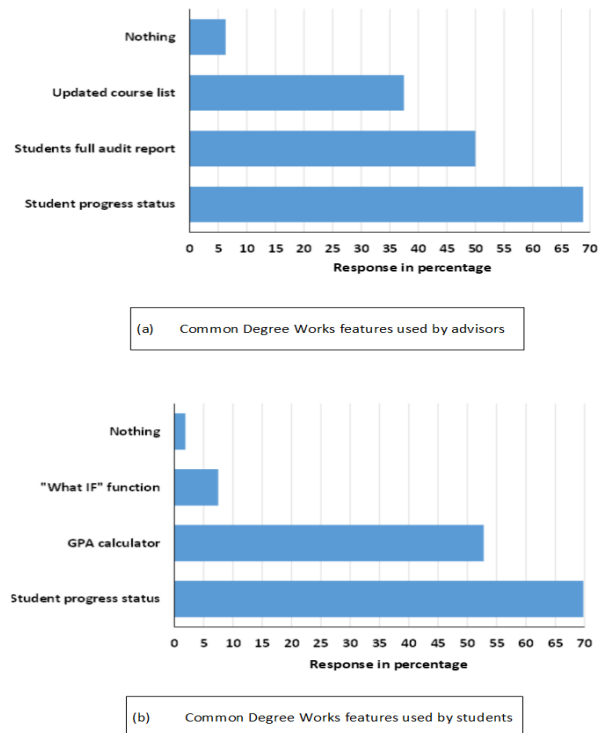
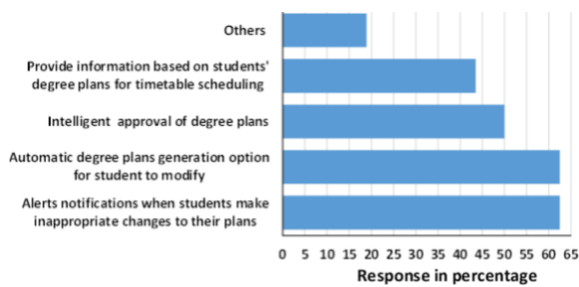


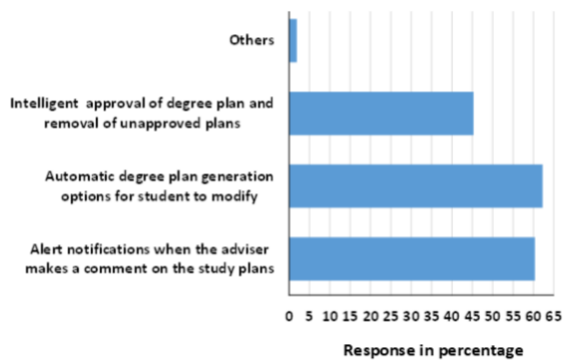
Fig. 12. Commonly used features in Degree Works

The participants also suggested some features that could help improve the Degree Works system used at UAEU. The most recommended suggestions, as shown in Fig. 13, included alert notifications for important activities and automatic degree plan generation options for student to modify. Based on this study, it is clear that students and advisors use the current advising system and find it to be an effective alternative to the paper-based system. However, as discussed, the research participants believe there is room for improvement.

5. Math



(a) Suggested improvements by the advisors



(b) Suggested improvements by the students

Fig. 13. Suggested improvements to the current advising system by the participants.

6. Conclusion

This paper details the new electronic advising system used at UAEU. Various problems with the paper-based advising system precipitated the recent switch to the more sophisticated web-based system. This paper summarizes the methods and results of a survey-based study conducted to rate the effectiveness of the current student advising system (Degree Works) used by the Department of Electrical Engineering College of Engineering. In general, both participating advisors and advisees found that Degree Works is an effective and user-friendly system for degree planning. The students reported that the system generally helps prepare a better study plan and reduces the meeting appointments. However, the results show that both advisors and advisees are

concerned about the lack of an alert mechanism that notifies users when important activities, such as changes to the study plans, are processed in the advising system. The findings also show that the student progress status, audit report, and GPA are most commonly used features of Degree Works. Notably, the survey revealed helpful suggestions, as prescribed by the students and advisors, to improve the system. Those suggestions were the inclusion of an alert notification feature and an automatic degree plan generation option. The results of this research could assist university administrators in adopting effective and appropriate features and software to improve the student advising systems.

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