AC 2007-2588: ENCOURAGING TRANSFER STUDENTS TO PURSUE A BACHELOR'S DEGREE IN ENGINEERING AND COMPUTER SCIENCE

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ENCOURAGING TRANSFER STUDENTS TO PURSUE A BACHELOR'S DEGREE IN ENGINEERING AND COMPUTER SCIENCE

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Abstract

The Maricopa Engineering Transition Scholars (METS) is a collaborative project to encourage community college students to pursue a Bachelor's Degree in engineering or computer science and also to support their transition and matriculation into a Bachelor's degree program. The project, sponsored by the National Science Foundation, and co-owned by the Ira A. Fulton School of Engineering and the Maricopa County Community College District, holds events at the community colleges to interest and support students to study engineering. The program also helps the transition with an orientation program and provides a METS Center to help support the transfer student in the Fulton School. This paper gives a summary of the current use of the METS Center and how it is viewed by the transfer students who gather in it and use it.

I. Introduction

Many students choose to attend a community college because they are not sure which major they want to pursue. While they are deciding their future major, they take the opportunity to attend a community college with low tuition fees, small classes, one-on-one interaction with their instructors, easy parking, and classes that easily transfer to a university. This is the situation with many of the 200,000 students who attend one of the ten Maricopa County Community College District (MCCCD) schools. In several of these schools, classes are available for the students to do the first two years of an engineering or computer science program and to earn an Associate Degree. Past research has shown that 50% of the community college students transferring to the Fulton School of Engineering only decided on a major in engineering or computer science after they were at the community college.[1] When the student has chosen a major, a second major decision needs to be made: to go on to a university and to select a university.

Each fall, for many years some 300 students transfer in the fall into the Ira A. Fulton School of Engineering at Arizona State University (ASU) with additional students transferring in the spring. Over half of these students transfer from the MCCCD. This decision is not an easy one. The community college students leave a small, friendly environment to major in engineering or computer science at the largest single college campus in the nation with over 53,000 students. On this campus they feel like freshmen all over again: parking is a nightmare, the pace of the classes is fast, the easy courses have already been taken, they don't know anyone in their classes, it is difficult to break into a study group that has been established for two years, the classes are large, and the location of resources is a mystery.

Since there are so many students attending MCCCD and all ten colleges are within easy driving distance of Arizona State University, it makes sense that collaboration between MCCCD and the Fulton School of Engineering should be established. It is well known that many women and underrepresented minority students attend community colleges. Since the challenges in transferring from a small, friendly community college to a large university can seem large, a goal of this collaboration is that the transfer student is assured of a soft, friendly place to land once the transfer has been made to ASU. The community college students can benefit from role models who transferred from their community college and who are now successful engineering or computer science students at ASU. Since many of the community college students have continued to live at home while attending a community college and may now also be working within driving distance of their home, most of the community college students who choose to go on for a Bachelor's degree will choose ASU since it is the only major school with engineering and computer science within driving range. The decision is much easier to attend ASU if the transfer student knows that there are people at ASU who care about them, who will help them with their transition, and that there is a place to meet with other transfer students.

The Maricopa Engineering Transition Scholars (METS) is a collaborative project funded by the National Science Foundation (NSF) that began in the fall of 2003 to encourage community college students to pursue a Bachelor's Degree in engineering or computer science. The project, co-owned by the Ira A. Fulton School of Engineering and the MCCCD, holds a "Be An Engineer" event at each participating community college each semester. The "Be An Engineer" event includes company booths with engineers, advisors from ASU and the community college, and representatives from ASU Financial Aid Services. The program includes a panel of ASU transfer students in engineering and a panel of working engineers. This event has previously been described[2, 3, 4] along with other activities of the collaboration. The METS project has as its goal to especially encourage and support women and underrepresented minority students to choose engineering and to continue to get a Bachelor's degree in engineering or computer science. In the academic scholarship program for transfer students, the students are also urged to go on to graduate school after they obtain the Bachelor's degree. The NSF provided some supplemental funding in addition to the original two-year funding for the project. As a part of the reduced funding, the administration of the project was changed from having two full-time directors, one each at ASU and MCCCD, to one half-time director.[5] This administrative change worked quite successfully and enabled the project to continue into the 2006-2007 academic year.

The METS program is continually being evaluated. Important to the continuation of the program is the space provided by the Fulton School of Engineering for the METS Center, a place that transfer students can come to meet and to study.[6] This Center includes space for the administration of METS, including the director and the METS staff (three engineering community college transfer students), three computers, a printer, study tables, and a conference room for special meetings. A kitchen with refrigerator and microwave is also a part of the Center. When the "Be An Engineer" events are held at the community colleges, the potential transfer students are told about the Center so they know that there is a place that they can go for information, support, to meet other transfer students, and to study. Transfer students have reported that the information about this Center helped them in their decision to continue their education past the Associate's Degree.

II. METS Center Usage

Data has always been kept on the use of the METS Center. Students are asked to log in and log out when using the Center for each visit so we can better understand the student use of the Center. A particular student may visit the Center several times in one day. During the Fall Semester, the average daily student attendance varied between 12.5 students on Friday to 23.5 students on Monday. See Figure 1.

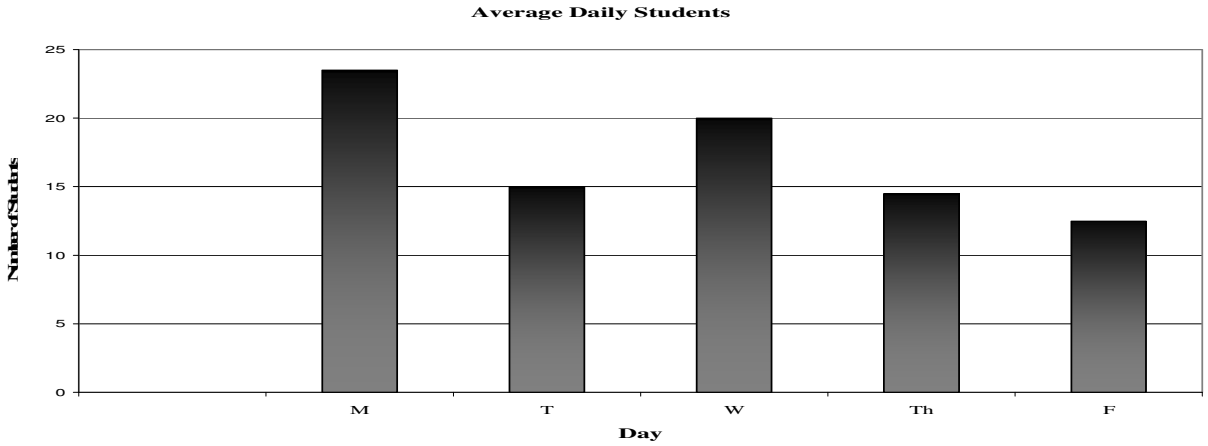

FIGURE 1. AVERAGE DAILY STUDENT ATTENDANCE IN THE METS CENTER BY DAY OF THE WEEK, FALL 2006

It is also interesting to see how many students on average are in the Center during the different hours of the day. Figure 2 shows that the average number of students throughout the day is almost a normal distribution.

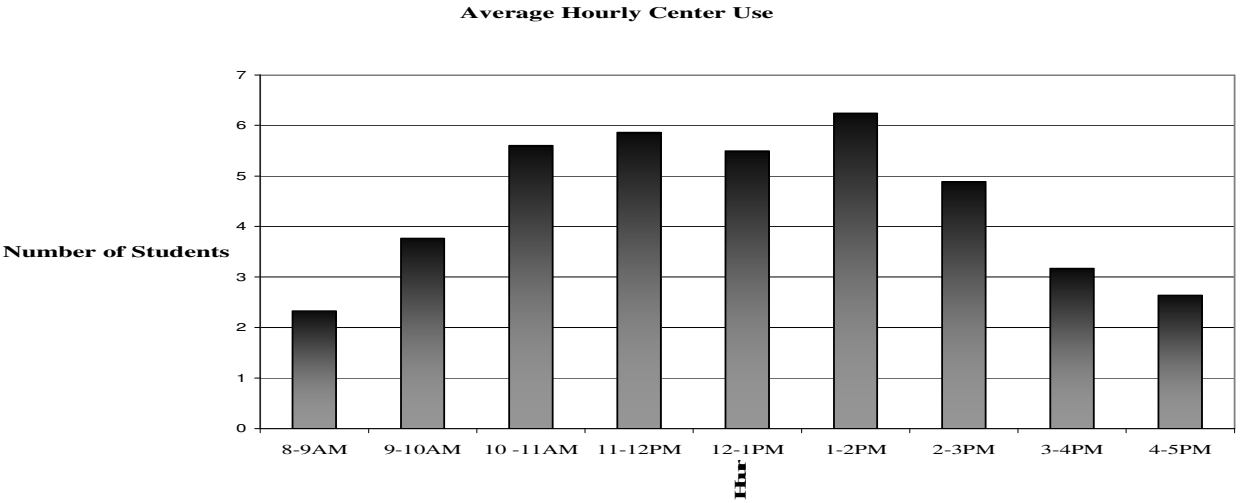

FIGURE 2. AVERAGE HOURLY CENTER USE DURING FALL 2006.

Another useful measure of the use of the Center is the daily average attendance per week. Figure 3 shows that the number was quite consistent with less students using the Center during the short Thanksgiving week 14.

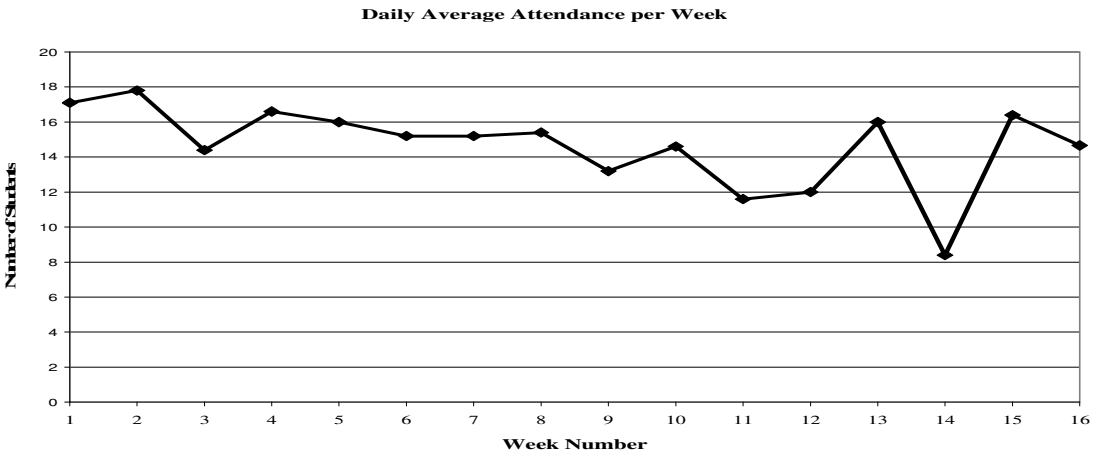

FIGURE 3. DAILY AVERAGE ATTENDANCE PER WEEK DURING FALL 2006.

There are two other measures that can also give us information on the value of the Center: the number of student visits per week and the number of different students that use the METS Center. This information is given in Figures 4 and 5, respectively.

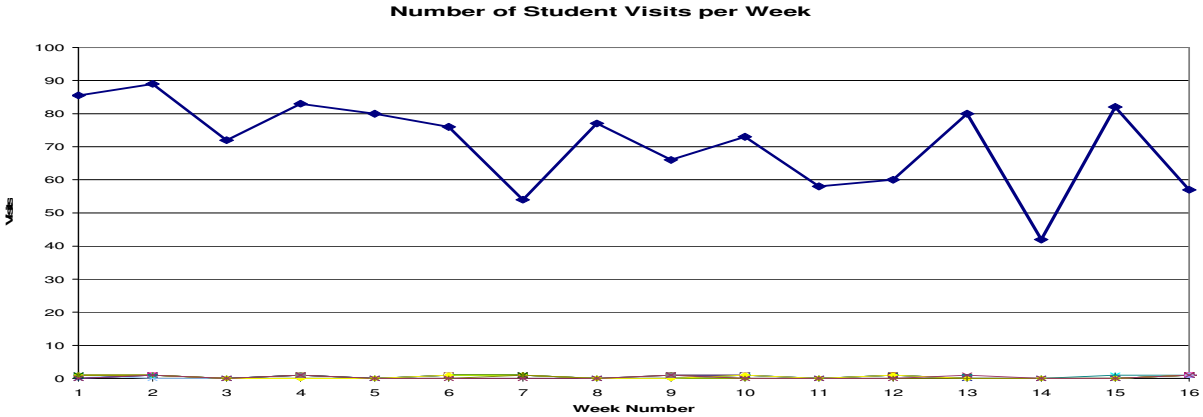

FIGURE 4. NUMBER OF STUDENT VISITS PER WEEK, FALL 2006

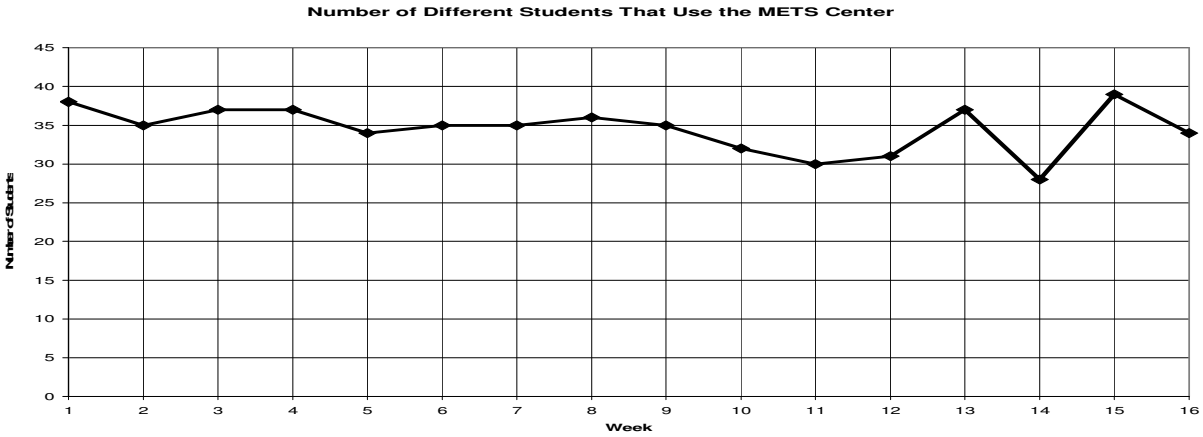

FIGURE 5. NUMBER OF DIFFERENT STUDENTS THAT USE THE METS CENTER, FALL 2006

In addition to the use of the METS Center study space, workshops are held regularly in the METS Center mediated conference room. Meetings are held there for the students of three academic scholarship programs, one of which is the Collaborative Interdisciplinary Research Community/METS (CIRC/METS) academic scholarship program, funded by the National Science Foundation. The students in CIRC/METS are all transfer students to the Fulton School of Engineering, most of them from the local community colleges. In addition to a scholarship, the students meet six times a semester (choice of three times for each meeting) to learn more about engineering, resumes, interviewing, internships, undergraduate research, what it is like in industry, and graduate school (including why, how to choose, how to apply, and why a graduate degree is good for industry and academia).[7]

III. Evaluation of METS Center by the Users

During the last two weeks of Fall 2006 semester, 33 students who regularly use the METS Center completed a questionnaire about themselves, their use of the Center, and their evaluation of the Center. Thirty-one of the 33 students who took the survey were community college transfer students. They met in the Center from 1-2 days per week to 4-5 days per week. The students all agreed that the METS Center open hours (8-5, Monday through Friday) were conducive to their needs. The students mainly used the Center to study. The students' reasons for coming to the Center are shown in Table 1. The students were allowed to list more than one reason.

Reason for Using Center	**Number of Students (n=33)**
Study	**25**
Use Computer/Internet	**13**
Use Printer	**8**
Meetings	**4**
Information/Advice	**3**
Refrigerator/Microwave	**2**
Relax	**1**

TABLE 1. ALL REASONS FOR USING CENTER FALL 2006, N=33.

When asked what they liked about the Center, the answers ranged from space to study to helpful, friendly people. Again, students were allowed to list more than one item. One student said that he liked to help others and wished the Center had been in existence when he first transferred. One student could think of nothing and another student said "everything." Table 2 shows the results of this question.

When asked what could be done to improve the METS Center to meet their needs, the most often mentioned item was more computers (n=8). Other items mentioned by more than one person included improved trash pickup, wireless connections, and free coffee. Several people said the Center was fine as it was. The students were also asked if they had attended workshops in the Center and what type of workshops they were interested in. Most of the students had not attended workshops other than regularly scheduled meetings. There was no consensus among the students on additional workshops that should be held. One student had attended a Guaranteed 4.0 Plan Workshop and found that very useful.

What do you like about the Center?	Number of Students (n=33)
Space to Study	9
Computers	9
Good, Relaxed, Comfortable Atmosphere	8
People: Helpful, Friendly	6
Free Printing	5
Location, Convenient	4
Quiet	2
Chairs	1
Fridge & Microwave	1
Snacks	1
Coffee	1
Help Others	1

TABLE II. THE REASONS THAT THE STUDENTS LIKE THE CENTER, FALL 2006, N= 33.

All of the students agreed that the computers and free printing were a necessary part of the Center. All of the students surveyed said that the METS staff was friendly and helpful. The students also agreed that the Center was helpful to them in meeting their graduation goals because of the study time associated with it. The students all planned to use the Center in the spring semester and rated the Center as valuable or very valuable in terms of value to their education.

IV. Challenges and Conclusion

Although the adequate study space is very valuable to the users of the Center, the Center could accommodate more students and still be a good place to study. The Center is a bit off the usual beaten track used by engineering students and so each semester METS staff man a table on the main mall calling students' attention to the Center and its location. The METS Center Conference room has been well used with academic scholarship meetings, as well as workshops specifically for transfer students.

The METS student staff have primarily been women or underrepresented minority students who are community college transfer students. These students often go to the community colleges for the METS "Be An Engineer" events. These students have proved to be so good, they usually do not last more than a couple of semesters before they are snapped up for an internship with one of the local industries. Therefore keeping a continuing METS student staff has been something of a challenge, but each time we have found a capable replacement. We have changed our rule that the staff member needs to be in at least their second semester at ASU. We have found that as METS staff the new transfer student acclimates very quickly to the Fulton School and ASU culture.

METS workshops have been offered at various times and with various themes. Most of the workshops are not well attended. The students that do attend the workshops find them very

worthwhile. Students are very busy and attending another event often seems overwhelming. We still need to work on this part of the project. A workshop on internships with representatives from two companies proved to be popular with at least 10 students attending after the time of the survey. Although a few students mention that they would like more Center hours, most students seem to do well with the 8-5 hours that are covered by METS staff from Monday through Friday.

We want to recognize and thank the Fulton School of Engineering for their provision of excellent space and recognize that the METS project and program would be almost impossible to run without the space.

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