

Why Do So Few Undergraduate Engineering Students Enroll in Summer Courses?

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ABSTRACT

This paper discussed the possibility of undergraduate students attending summer courses; specifically with the University of Dayton. 425 University of Dayton undergraduate engineering students responded to an electronic questionnaire with students responding that they would be more inclined to take summer courses if offered courses were applicable towards their respective degrees. Students reported enrolling in summer course work if they were behind on required courses due to time off for co-ops or internships during the academic school year. Most undergraduate students found however that needed courses were not always offered during summer semesters at the University of Dayton. Students also reported that even if they were inclined to take courses during the summer, financial aid was not available to pay for courses. Students further stated that paying full tuition for what in essence was an abbreviated semester carried no value added. Students commented that if tuition were discounted, or if they were able to access scholarships to pay for summer tuition, they would be more inclined to utilize summer semesters.

Additionally, 42 School of Engineering faculty members responded to a different electronic questionnaire sent out at the same time as the undergraduate questionnaire. Faculty reported that there was no value added to teaching during the summer due to small salaries and lack of student enrollment. Traditionally, faculty do not teach during summers in order to perform research and course revisions. With basically no incentives being offered to teach during the summer semester, faculty was disinclined to teach during the summer.

INTRODUCTION

It was uncertain if there was a desire or need by University of Dayton undergraduate engineering students to enroll in summer courses. To date, the topic has not been critically reviewed by the University of Dayton Administration. This paper attempted to examine the feasibility of

increasing the enrollment of undergraduate engineering students during future summer semesters.

College tuition is increasing each year for undergraduate studies and students are taking out more loans to pay for undergraduate degrees. Completing an undergraduate degree in 4 years or less would seem to be a positive motivator and summer courses should appeal to the average undergraduate student. However, many do not take advantage of the summer semester. A variety of reasons were offered by students such as summer employment to pay for expenses, co-op or internship employment, or to enjoy a break from studies for the summer. Another potential cause for university's lack of summer enrollment may be lack of faculty. A prevailing attitude by faculty is that their summers are needed to write or perform research, travel abroad, or change/update curriculum. Research suggests that if made available, students will perform as well, if not slightly better in summer college courses than they do during the traditional academic school year. It would seem that the benefits to the students of moving through a degree program quickly should outweigh the negative aspects.

A questionnaire was developed, piloted, modified, and subsequently completed by 425 undergraduate engineering students during the fall of 2011. At the same time, a questionnaire was developed then completed by 42 faculty members from the School of Engineering at the University of Dayton. The following are the summarized results of both questionnaires.

SCHOOL OF ENGINEERING UNDERGRADUATE SURVEY OF SUMMER CLASSES INTRODUCTION AND METHODOLOGY

The School of Engineering at The University of Dayton sought to understand the current barriers and potential strategies to increase summer class enrollment among engineering undergraduates. All undergraduates in the School of Engineering were sent an introductory e-mail from the Dean of the School of Engineering which asked them to take an on-line survey which would assist the School in understand the issues students face when they contemplate summer classes.

In all, 425 undergraduates from all undergraduate engineering majors (civil, electrical, mechanical, etc.) responded. They were evenly distributed by class standing: freshman, sophomore, junior, and senior. As an incentive, students who completed the questionnaire were placed in a random drawing of names to receive one of fifty gift certificates from local restaurants.

DETAILED RESULTS

Basic Information on Summer Class Utilization by Engineering Undergraduates

Respondents were asked (based on their year in college) whether they had taken summer classes each of the summers of their undergraduate career. The results illustrated that respondents were most likely to have taken summer classes at UD between their sophomore and junior years (39%) or junior and senior years (35%) and least likely to have taken them between their first and sophomore years (14%).

Sample sizes were sufficiently small that differences observed between majors should be treated with caution. However, the results do suggest that Chemical Engineering and Civil Engineering undergraduate majors were more likely to attend summer classes at UD between their sophomore

and junior years than between their junior and senior years, while Mechanical Engineering undergraduate majors were slightly more likely to attend between their junior and senior years rather than between their sophomore and junior years.

Given the results summer by summer, it was unsurprising that the percent of students who had attended summer classes at UD at least one summer steadily rose with class standing. While only 19% of sophomores reported to have attended at least one summer, 62% of the senior undergraduate respondents stated they attended summer courses at some point during their academic career at UD, with the greatest number being from the computer and electronic technology departments respectively. In general, respondents who attended summer classes at UD did so only one summer, and while 49% of senior respondents attended one summer, only 9% had attended two summers, while only 4% had attended 3 summers of classes at UD.

Basic Reasons for Not Taking Summer Classes in a Particular Summer

For respondents that indicated they did not take summer classes, they were given a list of potential reasons and asked to check all that applied. There were systematic differences in the prominence of particular reasons for not taking summer classes over the course of an undergraduate's academic career. Considerations of working to earn money, spending time with family and friends, parental desires, and seeking time off were all more prominent as reasons for not taking summer classes between the first and sophomore year than in the latter years. Job opportunities/co-ops/internships that could help in a future career were listed much more often as a reason not to take summer classes in the latter two summers than in the first summer.

About half of the responses in the "other category" referred to being a transfer student. Only a few responses from each grade year indicated that the right courses not being offered made a difference.

Importance of Expense in Not Taking Summer School

It was not surprising that the vast majority of respondents indicated they would have taken summer courses if they had been paid for by UD. It should be noted that the percent who said "Yes" to this question does start to decrease for those students who were juniors or seniors. Almost all respondents (95%) who had not taken summer classes between the first year and sophomore year would have taken classes if UD had paid the tuition. This percent decreased to 87% between the sophomore and junior year, and to 80% between the junior and senior year.

When queried about summer school plans for the next summer, sophomores were more likely than first year students to take summer courses, and juniors indicated they were "Likely" or "Very Likely" to consider taking summer courses at UD this next summer (70% vs. 31% and 43%). The prospective split between sophomores' plans and juniors' plans (70% vs. 43%) are more substantial than the retrospective look (39% vs. 35%) suggests.

Students were provided a list of possible reasons they were not likely to take summer classes at UD this next summer. First year students were more likely than sophomores or juniors to indicate they would be working to earn money, or spending time with family and friends, or taking college classes near home and needing time off then they were likely to take summer classes at UD. Sophomores and juniors by contrast were much more likely than first year

students to indicate a job opportunity/ co-op/ internship that would help in future career possibilities then taking summer classes at UD for this next summer (82% and 85% vs. 24%).

First Years, sophomores and juniors who had indicated they were not likely to attend summer classes at UD this next summer (24%) stated that some form of scholarship or lower tuition would make a difference in whether to attend summer courses at UD. Other than the cost issue, no other particular suggestion was mentioned by a substantial percentage of respondents.

Suggestions that Would Have Increased Likelihood of Attending Summer Classes at UD

Seniors were asked if there were any changes the University of Dayton could have made that would have increased the likelihood of their attending classes. Of the 108 seniors, 81 provided responses. Having the right courses, particularly in their major, came up most frequently (33%), followed by concerns with expense (25%).

Responses to Potential Suggestions

All respondents were asked to rate on a scale of 1 to 5, with 1 being very UNIMPORTANT and 5 being very IMPORTANT, potential actions that a university might take to encourage summer class enrollment. The three actions with the higher mean importance ratings than the others indicated that offering financial aid in the summer, offering more courses specific to the students discipline, and making it easier to utilize financial aid in the summer were the most important actions a university could implement to encourage summer enrollment.

Chief Reason to Consider Summer Classes

When asked which response best captured the chief reason to consider summer course enrollment, respondents were evenly split between “decrease(ing) the total time it takes to graduate” (37%) and “taking additional coursework (which was) hard to fit into a fall/winter schedule” (40%) were the chief reasons to consider taking summer courses. First year students were more likely than upper level students to focus on “decreasing the total time it takes to graduate”.

Among the 58 respondents indicating “other reasons”, more than half (59%) focused on wanting to make up time from working on a co-op. A smaller percentage (19%), mentioned reducing course load for the following academic school year.

Respondents who indicated they had taken summer classes in a particular summer were asked what courses they had taken, and why they had taken each course. While a count of responses for particular courses was shown, it should also be kept in mind that the sample systematically falls in number moving from summer to summer for each respondent.

An examination of reasons for taking summer courses reflected the relative importance of taking courses while making up for a co-op in a prior semester, or being involved in a co-op in during the current summer semester. Not surprisingly, the nature of courses of interest varied systematically depending on which year the student was in school.

Courses taken during the summer between first year and sophomore year was a combination of general education and engineering courses, with students reporting that they took the courses for a variety of reasons, with the most consistent reason being either that the student was retaking a

course due to a low grade during the academic school year, or the course was part of a cluster and was thus required.

The reported courses taken between sophomore and junior year were primarily required engineering courses, as well as a few general education courses. Here again, the primary reasons students gave for taking summer courses were that they were behind in coursework and needed to get caught back up, or that they were taking courses which were part of a required cluster.

Courses taken during the summer between junior and senior year in college were mostly required engineering courses with a few students reporting that they took one of their courses for their minor during the summer. Primary reason given for taking summer courses for this group were being behind due to a co-op or to free up time for their final year of courses, or the standard response of taking a required cluster course.

SCHOOL OF ENGINEERING FACULTY SURVEY ON SUMMER CLASSES

Introduction and Methodology

This report summarizes the results of an on-line survey of engineering faculty on the subject of summer school teaching. The survey was introduced to faculty via an e-mail from the Dean of the School of Engineering at the University of Dayton which sought to understand the issues faculty faced when they contemplated teaching summer courses.

In all, there were 42 respondents, with distribution having been fairly even across all engineering departments, and relatively even across the length of time as a faculty member at the University. Full professors are a substantial plurality of respondents (41%). In the sections that follow, the faculty survey results are provided.

DETAILED RESULTS

Experience with Summer Teaching

Faculty was asked on their questionnaire if they had taught courses at some point over the past 3 summers at the University of Dayton. The majority of respondents, (57%), had taught summer classes at some point during the last 3 summers. Respondents from Engineering Technology were slightly less likely to have taught than those from the other engineering departments. Full professors, and those who had been at the university for more than 15 years, were less likely to have taught summer classes during the past 3 summers. When asked how many of the last 3 summers had they taught, among those who had taught summer classes in the last 3 summers, two thirds had taught every summer.

Reasons for Not Teaching Summer Classes

Respondents who had not taught at all (18), and those who not taught every summer (8,) were given a list of potential reasons for not teaching. About half of the relevant respondents indicated that devoting all their time to research (50%) or a research grant which provided summer income (46%) were the main reasons that applied to not teaching summer classes. Additionally, two individuals mentioned poor pay, while three individuals mentioned administrative duty which

prevented them from teaching during the summer. Additionally, two individuals reported that they were new employees, and thus had been unable to teach during the summer. Some additional responses included “Perceived pressure of tenure-track expectations”, “Chairmen are punished if they teach in the summer”, and “Insufficient student population, summer offering reduced class size during FA & SP terms, also needed to spend summer fixing lab equipment” rounded out non-typical responses from the faculty surveyed.

Increased Pay as a Potential Incentive

Respondents who had not taught at all (18) and those who had not taught every summer (8) were asked if they would be interested in teaching summer classes if the pay were higher. More than two thirds (69%) of those who had not taught or not taught every summer would have been interested if teaching during the summer paid at a higher rate.

Of the 18 respondents who indicated that higher pay would make a difference in their decision on summer teaching, the median increase required was 33%. It should be noted that there were some respondents who required substantial increases in pay in order to consider teaching during the summer semester. One individual who did not mention a particular positive increase believed that there should be efforts made to increase student enrollment to justify higher summer pay. It must be noted that faculty summer pay per course is a function of the enrollment, but cannot exceed 1/12 of a 9 month salary for each professor.

Faculty Understanding of Obstacles to More Summer Teaching and Suggestions to Increase Faculty Interest in Summer Teaching

The University of Dayton sought to understand what the primary obstacles to increased faculty interest in summer teaching at UD were. Overwhelmingly, faculty believed that summer teaching was compensated at a lower rate than teaching during the full academic school year, and that summer pay should be increased to provide a greater incentive to teach summer classes. Several faculty members who completed the questionnaire provided detailed calculations to explain their viewpoint. A variety of other comments were made by respondents, but the essential issue was compensation, followed by increased or guaranteed student enrollment during the summer.

CONCLUSIONS

Students would be more inclined to take summer courses if they had the ability to take courses that were applicable towards their degrees. This is especially true of those students who needed to make up missed time due to co-ops and internships during the academic school year. Generally, students found that needed courses were not offered during summer semesters at the University of Dayton. Students also reported that even if they were inclined to take courses during the summer, financial aid was not available to pay for courses. Students also decided that paying full tuition for what in essence was an abbreviated semester carried no value added. Students also stated that if tuition were discounted, or if they were able to access scholarships to pay for summer tuition, they would be more inclined to utilize summer semesters.

Equally, faculty found that there was no value added to teaching during the summer due to small salaries and lack of student enrollment. Traditionally, faculty used summers off to perform

research and travel abroad. With no incentives at all, nearly all faculty who responded stated they were disinclined to teach during the summer.

Until these issues have been addressed, there would be no reason for the University of Dayton to implement a summer semester which would attract more numbers than that which already exists.

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