

AN EVALUATION OF THE ACADEMIC PERFORMANCE OF STUDENTS ENROLLED IN THE DOUBLE MAJOR PROGRAMMES OF ARCHITECTURE AND CIVIL ENGINEERING

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ABSTRACT

Double major programs allow students to simultaneously obtain diplomas in two related academic programs by satisfying their graduation requirements. Students of architecture and civil engineering at the Istanbul Kultur University can apply for the double major program between the third and fifth semesters of their undergraduate education providing their GPAs are at least 3.00 out of 4.00 and they need to maintain their GPAs above 3.00 to continue the double major program. Although all double major programs are demanding and require keen interest of the students, the double major program is particularly challenging due to the differences in educational models used in engineering and architecture. Engineering education largely depends on classroom teaching and laboratory work whereas the architectural education is centered on the design studios. This paper attempts to evaluate the academic performance of civil engineering and architecture students enrolled in the double major program at the Istanbul Kultur University and outline the challenges of a double major program of engineering and architecture.

Key Words: Architectural Education, Civil Engineering Education, Double Major Programs.

INTRODUCTION

Double major programs allow highly motivated and successful students to obtain bachelor's degrees from two undergraduate programs with compatible curriculums. Undergraduate students of these departments can apply for the double major program as early as the third semester of their undergraduate education. Students cannot apply for the double major program after their fifth semester. The candidates of the double major program must have a proven academic record with a grade point average (GPA) above 3.00 out of 4.00. The student who are enrolled in the double major program need to maintain their GPAs above 3.00 in order to continue and graduate from the double major program. Students of the double major program are only allowed once to have a GPA as low as 2.75 out 4.00 throughout their education and students must complete the double major program are required to complete the program within 10 years. The students who fail to meet the required academic standards are dropped out of the double major program (www.iku.edu.tr).

Undergraduate students enrolled in the civil engineering and architecture programs of Istanbul Kultur University program can apply for the "Double Major Program" which allows them to obtain Bachelor's degrees in both civil engineering and architecture. Civil Engineering and Architecture undergraduate programs of Istanbul Kultur University have started in 1997 and 1998, respectively. The language of instruction of the Civil Engineering undergraduate program is English and the students are required to complete the English Preparatory Program in order to begin their undergraduate education unless they pass the English qualification exam at the beginning of the school year whereas the language of instruction of the Architecture undergraduate program is Turkish and it is optional for architecture students to complete the English Preparatory Program.

DOUBLE MAJOR PROGRAM OF ARCHITECTURE AND CIVIL ENGINEERING AT IKU

The applications for the double major program of architecture and civil engineering started at the year 2000. Since the establishment of the Departments of Architecture and Civil Engineering, 24 students from the Department of Civil Engineering and 3 students from the Department of Architecture have applied for the double major program. The difference in the language of instruction between the Departments of Architecture and Civil Engineering plays a role in the reluctance of architecture students in applying for a double major program with civil engineering. An architecture student needs to pass the English qualification exam or successfully complete the English Preparatory Program in order to take courses from the Department of Civil Engineering, whereas, the civil engineering students can easily take courses from the Department of Architecture since the language of instruction is Turkish. The number of applications to the double major program from the Departments of Civil Engineering and Architecture are outlined in Figure 1 with respect to the year they started their undergraduate studies at the Istanbul Kultur University. Majority of the applicants for the double major program are from the students of Civil Engineering Department and as the double major program is quite demanding in terms of academic requirements, a maximum of 4 or 5 students apply to the program each year.

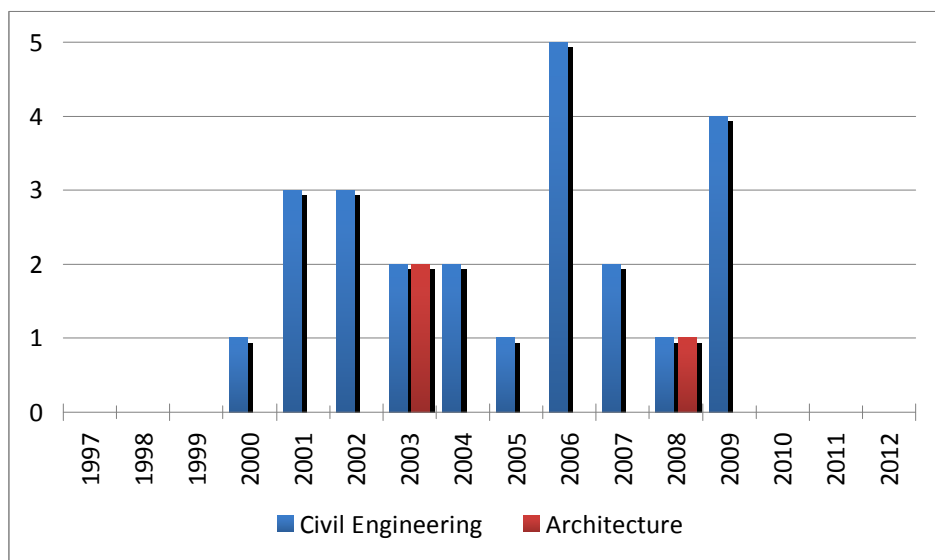


Figure 1: The number of applications to the double major program between 1997 and 2012

A significant portion of the double major students find it hard to keep up with the academic requirements and leave the program. Only 1 student out of the 3 double major students from the Department of Architecture has successfully completed the program while the other 2 students left the program. Similarly, only 4 students from the Civil Engineering Department have completed the program so far and 7 are still continuing the program while 13 students have left the program. The number of students who have either completed the program or are still continuing the double major program from the Departments of Civil Engineering and Architecture are presented in the (Figure 2) with respect to the year they started their undergraduate studies at the Istanbul Kultur University .

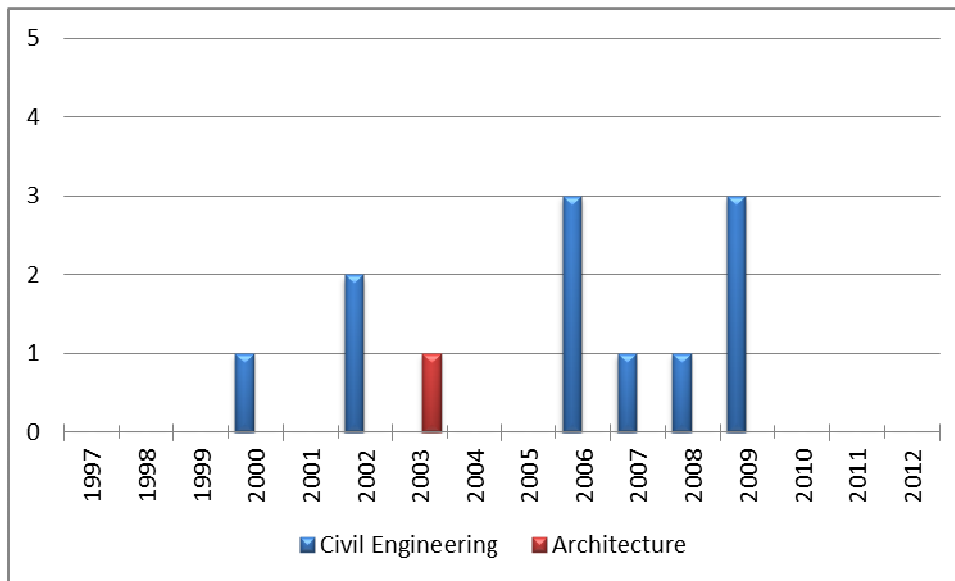


Figure 2: The number of students who have either completed the program or are still continuing the double major program with respect to the year they started their undergraduate studies at the Istanbul Kultur University.

The number of students who have left the double major program from the Departments of Civil Engineering and Architecture are presented in the (Figure 3) with respect to the year they started their undergraduate studies at the Istanbul Kultur University.

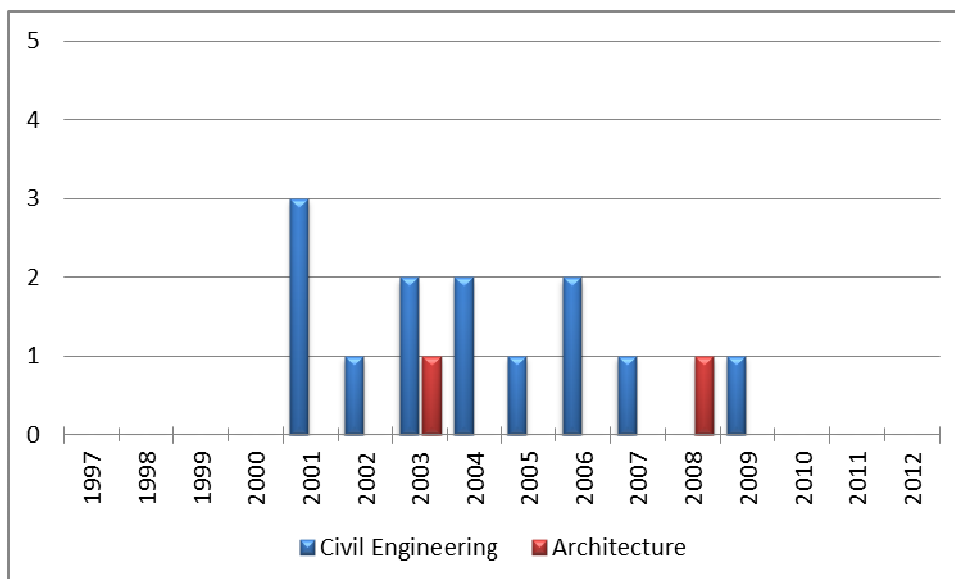


Figure 3: The number of students who have left the double major program with respect to the year they started their undergraduate studies at the Istanbul Kultur University.

A brief overview of the grade point averages of double major program students who left the program to pursue their original degree program is presented in the (Figure 4) and the grade point averages of the double major program students who either completed or are still continuing the program is presented in the (Figure 5). The 2 students who left the double major program to pursue their undergraduate degree at the Department of Architecture are denoted by ARC, whereas, the 13 students who left the double major program to pursue their undergraduate degree at the Department of Civil Engineering are denoted by CE. The grade point averages of the students at Civil Engineering courses and Architecture courses are shown in blue and red, respectively. It is difficult to make any generalizations with the limited number of students in this study, however, focusing on 2 different programs at the same time seems to have had negative effects on the overall academic performance of the students who left the program. Almost half of these dropped their grade point averages below 3.00 out of 4.00 which is the baseline GPA required to apply for the program.

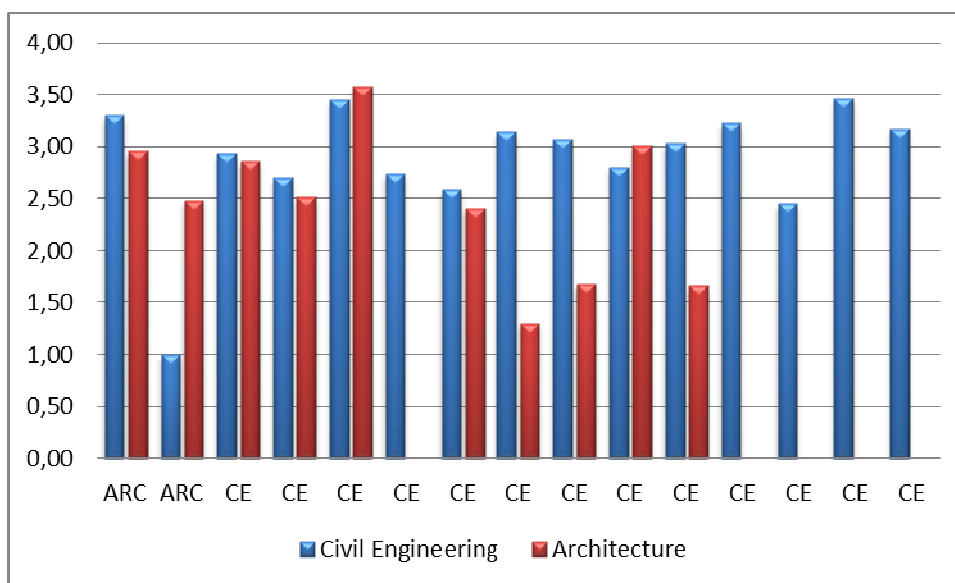


Figure 4: The grade point averages of double major program students who left the program to pursue their original degree program

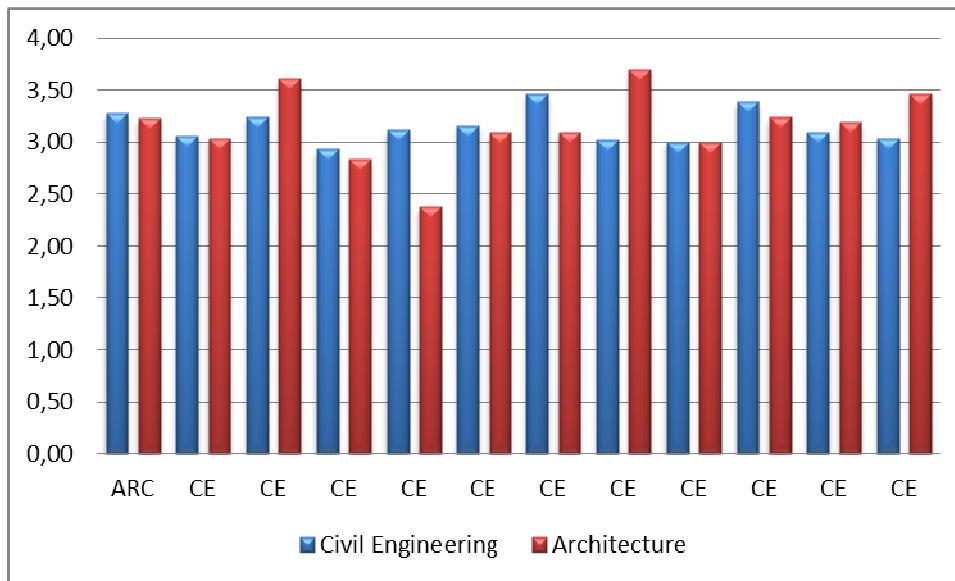


Figure 5: The grade point averages of double major program students who either completed or are still continuing the double major program

The number of semesters the students who left the double major program spent on the program before returning to their initial undergraduate programs is shown in Figure 6. A great majority of these students left early on in the the program. Nine students, including the 2 civil engineering students who never took any courses from the Department of Architecture, left the double major program just after one semester.

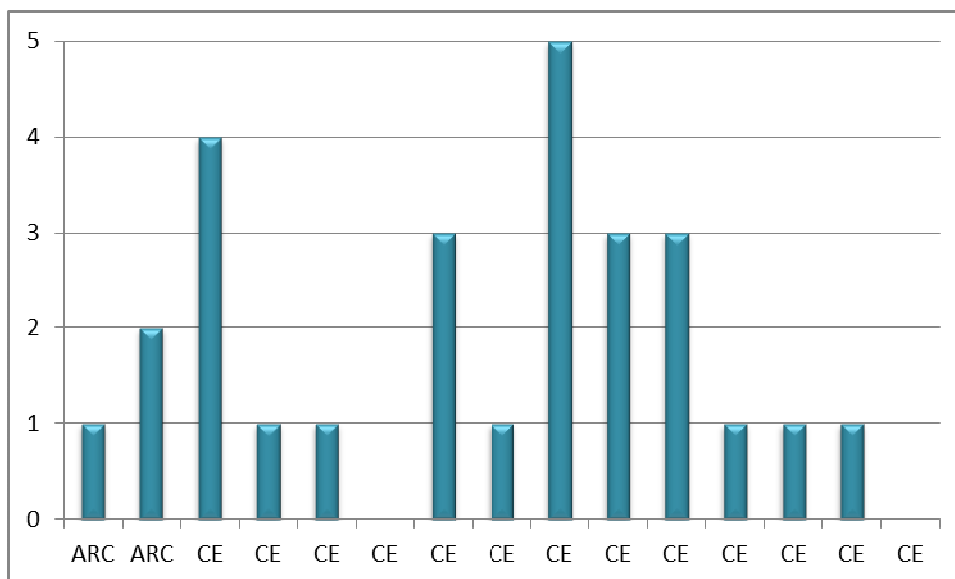


Figure 6: The number of semesters spent on the double major program by the students who left the program.

A student can apply to the double major program as early as their third semester and as late as their fifth semester of their undergraduate program. The starting semesters of the students who left the double major

program and the students who either graduated or are still continuing the program are shown in Figure 7 and Figure 8, respectively. Both figures show that a great majority of the students apply for the double major program immediately after their third semester. According to Figures 7 and 8, the students who applied for the program after their fifth semester tended to leave the program more than the students who started earlier on.

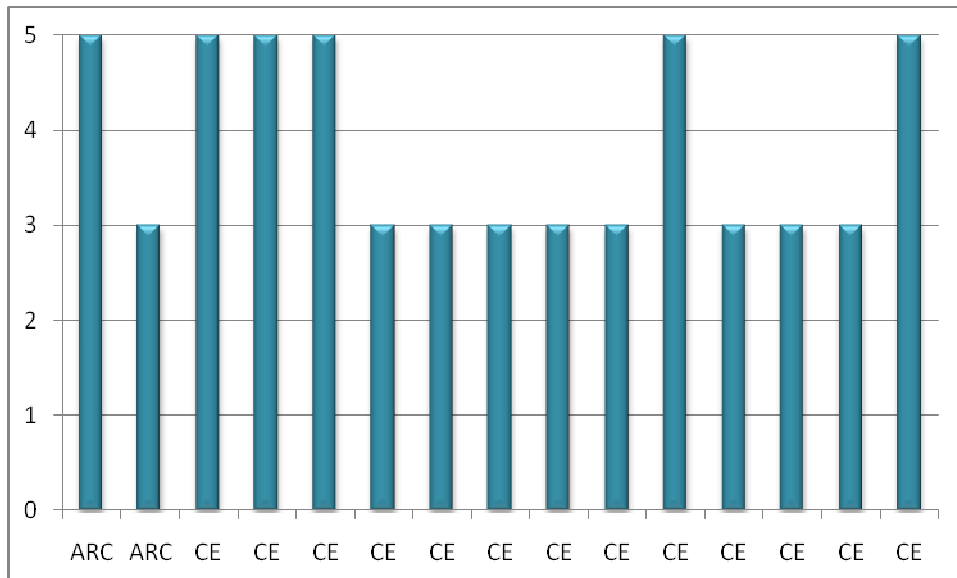


Figure 7: The starting semesters of the students who left the double major program

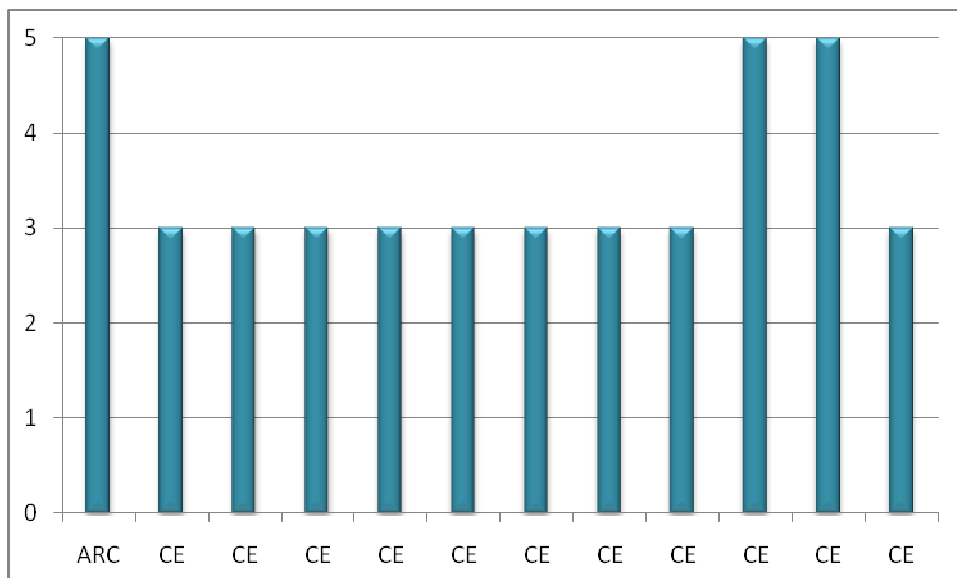


Figure 8: The starting semesters of the students who either graduated or are still continuing the double major program

RESULTS AND CONCLUSIONS

Although all double major programs are demanding and require keen interest of the students, the double major program is particularly challenging due to the differences in educational models used in engineering and architecture. First of all, engineering education largely depends on classroom teaching and laboratory work whereas the architectural education is centered on the design studios. The design studio is a unique learning environment which is commonly seen as a melting pot of design knowledge acquired in various courses need to be integrated in dealing with a comprehensive design problem. In the architectural design studio, the students need to be able to verbally and visually express and communicate their design ideas in a group setting (Kvan and Yunyan, 2005). Engineering students, especially those who do not apply for the double major programs early on, are likely to have difficulties in adapting to this unique learning environment and in visually communicating their design ideas.

The undergraduate curriculums of architecture and civil engineering share many common courses such as mechanics, structural analysis and reinforced concrete; however, there are fundamental differences between these programs. Architectural design education embodies elements of art as well as science. Architectural design students are taught to abstract and visually communicate their ideas starting from the first year of their education. On the other hand, first year engineering education mainly concentrates on fundamental sciences and mathematics, which are essential for establishing a strong theoretical foundation for the engineering analysis and design courses in the curriculum. A unique way of thinking and reasoning required for succeeding in each profession is slowly and subtly developed over the following years. Although, double major students are required to take most of the courses in each curriculum, shifting the mode of thinking to succeed in architecture and in civil engineering can be problematic, especially after a certain mind set has already been established.

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