



On the building of a learning environment for Mathematics in Architecture

Omar Gil

Universidad de la República
Facultad de Arquitectura, Diseño y Urbanismo
Cátedra de Matemática
Montevideo, Uruguay

omargil@fadu.edu.uy

ABSTRACT

We discuss the transformation of the teaching of Mathematics for students of Architecture in our School. By 2013 a course of Mathematics about basic calculus and vector space geometry was mandatory for freshmen. The performance of students was poor. This year we started to reorganize the course. We dismissed the division in lecture and recitation, and organized the classroom in permanent teams of 5 to 7 students. Based on this scheme, we applied principles of active learning [2,3]. We adopted an evaluation system with in-class quizzes, partial examinations and self and peer evaluation. The first two combine individual and team work and give opportunities for redoing. The latter was based on rubrics that made explicit the attitudes we expected from students. We invested a big effort to establish a good atmosphere in the classroom. In general lines, we tried to create a supportive environment, by paying careful attention to all aspects involved in learning [1]. A very successful summer session has been offered since the end of the academic year 2013, in February and March of 2014. In 2017 a new curricula for the studies of Architecture allowed to offer students the possibility to choose between one of three courses: calculus with applications to strength of materials; geometry of planar representations of 3D objects; symmetry of rosettes, friezes, wallpapers and polyhedra. In parallel, a program of peer tutors was established. Along this period we developed a set of notes, a collection of videos and a friendly workspace on a Moodle platform.

The combination of these actions improved the performance of students and cut by a factor close to three the time required to complete the course. When interviewed, students systematically express satisfaction about the organization and climate in the classroom, the evaluation system and the resources available.

References

- [1] Ambrose, S., Bridges, M.W., DiPietro, M., Lovett, M.C. and Norman, M.K. (2010). How learning works. Seven research-based principles for smart teaching. San Francisco, John Wiley & Sons.
- [2] Mazur, E. (1997) Peer instruction: A user's manual, Upper Saddle River, NJ: Prentice Hall.
- [3] Michaelsen, L.K., Bauman Knight, A. and Fink, D.L. (editors) (2004). Team Based Learning. A transformative use of small groups. Sterling, VA: Stylus publishing.

