Fibonacci Forever: Electronic Teaching Resources and Mathematical Topics from Antiquity

Dorothy M. French
Community College of Philadelphia (United States of America)
dfrench@ccp.edu

Writing about architecture over two millennia ago, Vitruvius listed the ideals of strength, usefulness and beauty in buildings and constructions. In mathematics also, there are topics based on classical mathematics from antiquity that arguably have the same characteristics of firmitas, utilitas and venustas. This paper is an account of the integration of historically relevant mathematical applications into a community college geometry for design course. Topics of study have included the Fibonacci sequence and the Golden Mean, the Pythagorean Theorem, points of concurrency of triangles, the Platonic Solids and Euler's Theorem and the tessellations and transformations found in the work of M. C. Escher. These classical areas of interest and discovery are now, more than ever, accessible through many web sites that feature compelling graphics and animations, hot links and inventive "apps" that are informative and interactive. Use of technology, coupled with traditional hands-on, activity-based methods, can help create a productive, interactive environment for studying mathematics. Community College students enrolled in design curricula -- CAD (computer assisted design), construction management, fine/applied art and interior design -- who need to take a mathematics course can study Geometry for Design, a special course that was created with them in mind. In this technology-rich course, students use computer-assisted drawing programs, model-making, interaction and hands-on and internet - based activities, and classical geometrical topics are naturally embedded in the curriculum. In contrast, many students studying an alternative course, Intermediate Algebra, are learning mathematics in a traditional setting that is lecture-oriented and does not use classroom-based computer technology or hands-on activities. These students are exposed to far fewer references to the history and development of mathematics. To gain a better understanding of the impact of the inclusion of activities based on topics from classical mathematics, outcomes and attitudes for students studying the two different college math courses, Geometry for Design and Intermediate Algebra, are compared and discussed.