Chapter 24

Geometry and Pastry Making/
Tesselations and Decorations:
Teaching Experience Between
Real and Virtual

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ABSTRACT

One of many projects in virtual worlds in Opensim, platform devoted to teaching, perhaps the most distinctive and significant, was the one that had as its purpose the application of mathematics to the culinary art in a hotel school. It was an experimentation iTEC (Innovative Technologies for an Engaging Classroom) and innovative teaching methodology was used, with the help of new technologies, using Opensim and several useful widgets to your project. Studying geometry, using various geometric shapes conceived, designed and processed, they are built in 3D tessellations in opensim, then reproduced in laboratory confectionery, sugar paste and used to decorate cakes with colored geometric elements and special shapes. All through insights, searches on the net, development of concept maps, team work, aimed at the development of pupils’ blog and lots of fun. Was also attended by the industry’s most experienced students and faculty kitchen, for processing geometric tessellations cakes.

INTRODUCTION

The learning experience told in this chapter has been designed and lived by professor Luisa Giannetti, a math teacher at the IPSEOA - State Professional Institute for Food Services and Hospitality - Cavalcanti in Naples.

Before moving on to high school, the author had already implemented numerous projects aimed at increasing students engagement and preventing early school leaving in a lower secondary schools of a borderline poor urban area where students showed very little motivation in school activities, left school earlier than expected, had family family problems. Also, generally speaking, the study of mathematics

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does not always fascinate everyone, being considered a ‘difficult’ discipline that requires hard work. Moreover, students do not always have the necessary foundation to study and deal with it satisfactorily. For all the former reasons the author has always been looking for something capable of interesting less motivated students - those who say: “I do not understand math” or “I had a fight with mathematics” or “but to me what good is mathematics” - trying to draw the teaching of maths from practical cases, real everyday things where math is embedded, aiming at boosting up pupils interest and make them understand the importance of math in real life and its wide application in every field.

The lessons were always based on interaction with the students, starting from concrete examples to lead students to elicit rules, theorems and formulas, exchanging hypotheses, experiences and insights.

### Teaching in Virtual Worlds

The author started experimenting in the Opensim platform in 2009, together with some colleagues from other parts of Italy who were interested in ‘teaching in virtual worlds’, collaborating online, meeting ‘inworld’ as well as in real life. In the beginning there were about a dozen teachers from various orders of school and various regions of Italy. In the evening they met “inworld” and planned, built, experimented with interactive learning objects, discovering new learning paths, simulating immersive situations that targeted students ‘ interest, as alternatives to traditional teaching. Over seven years the platform has become very populated and it now has many “sims” where many teachers have involved their students in virtual learning activities.

In recent years virtual worlds have often been used for educational purposes, engaging more and more students in studying various disciplines and experimenting in various opensim platforms. A new immersive approach to teaching maths has been created, where students, enter the world with their avatars and learn by playing, using game-like software in a game-like environment built in collaboration with their teachers; they learn how to solve logical problems by the use of simple as well as complex geometric constructions, not always reproducible in the real world, that would help them better understand properties and theorems.

In this way, students deepen their knowledge discovering the learning power of curiosity and knowledge applications rarely given in their textbooks. They interact with students from other schools, collaborate and learn together at a distance, comparing each other’s reality, knowledge and interests. All this by accessing the OpenSim through their computer and participating in the operational practice in the guise of avatars.

Various mathematic-related educational activities were designed in different regions, ranging from running tests and quizzes in itinerant paths, recreational games and simulations with a mathematical background, to construction activities to enhance the knowledge of solid geometry, moving activities to understand and deepen understanding of geometric transformations, immersive activities in areas devoted to mathematical games related to optical illusions or fractals and, finally, simulations of useful tasks for the INVALSI national tests - ‘an exciting practice, engaging, which allows access to a digital environment with persistent and conscious illusion of living in a world that uses “immersive modeling techniques” ’  

(Garavaglia, 2010)

There were also important e-twinning activities with pupils from other schools in various Italian cities, who participated and collaborated in creating blogs where they narrated their learning routes, with photos, logbooks, clips and reports throughout the learning process.