

Chapter 15

Hooked on Mathematics

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ABSTRACT

Within a flexible-learning framework, blended learning offers a unique opportunity to fully amalgamate pedagogy and technology in teaching and learning. It may also lead to significant enhancements and integrations of curriculum design. This chapter discusses the implementation of the i²Flex methodology, which is a type of blended learning, in a math classroom at ACS Athens, Greece. The definitions of the methodology are stated and the classroom applications are described. A middle school math teacher and the Math Studio coordinator designed a specific unit of work in mathematics in order to convert it to i²Flex delivery. The classroom atmosphere is described in detail, and a range of considerations about the methodology is discussed. Finally, the Community of Inquiry (CoI) framework is discussed as an evaluation tool of the methodology for the success of the methodology.

INTRODUCTION

In this chapter the readers will have the opportunity to explore the different applications of the i²Flex learning methodology as it is applied in a middle school math classroom and in the Math Studio of the American Community Schools (ACS) of Athens in Greece. ACS Athens is a student-centered international school located in Athens, Greece. The school's mission statement is to embrace American educational philosophy, principles and values. Through excellence in teaching and diverse educational experiences, ACS Athens challenges all students to realize their unique potential --academically, intellectually, socially and ethically--, and to thrive as responsible global citizens.

The i²Flex methodology has been established at ACS Athens, because we have realized that a new kind of learner is born: *the digital native* (Prensky, 2001). This new kind of learner has different characteristics from the learner in the past. S/he is a multi-tasker, highly visual, uses parallel processes, enjoys working in teams, collaborating, sharing & exchanging ideas. Furthermore, it makes him/ her happy to

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take on different roles in his/ her learning; either as a student, an instructor, a facilitator or a supporter of others. That new learner also needs our immediate feedback and responsiveness. Finally today's learner is very independent and able to teach himself/ herself with guidance.

Due to their different characteristics the *digital natives* have different preferences during the learning process. They prefer hyperlinked information that comes from many sources. They prefer processing pictures, sounds and videos rather than text. They love experiencing and learning by discovery rather than being lectured. They like interacting with content to explore and draw their own conclusions. They adore simulations, games, and role-playing. Furthermore, they want to learn “just in time” having access to relevant information they can apply immediately. Finally, they want to construct their own learning – assembling information and tools from different sources.

Apart from the new kind of learner, ACS Athens educators are facing an extra challenge. Student populations come from diverse backgrounds. They experience disruption from frequent relocation, and adjustment to the new school environment may create additional learning challenges.

For all the above reasons there was a great need for a new teaching methodology to be adopted: the i²Flex methodology (Avgerinou, Gialamas, & Tsoukia, 2014). This blended style of learning offers technology-assisted, data-driven opportunities, personalized instruction and most of all flexibility, in order to help educators meet teaching challenges and make learning a more tailored and inspiring experience for the student.

The i²Flex model is designed for a student-centered, technology-rich learning environment. Due to its flexible nature it enables learning communities to make a shift. The model turns the educators into facilitators and allows them to implement constructivist and student centered approaches to teaching and learning to trigger and inspire further diverse experiences, leading to a deeper conceptual understanding. It facilitates construction of knowledge and the development of life-long learners. Opportunities for productive dialogues between the teachers and the students are offered, inquiry-based learning takes place through open-ended questions, and the creation of a classroom atmosphere that encourages autonomy is provided. This set up encourages and challenges students to realize their true ability and potential: academically, intellectually, socially and ethically to become responsible, global citizens.

The i²Flex model enables the instructors to think outside the classroom borders and limitations, and really make the student the center of the learning process, based on their needs and preferences. At the ACS Athens Mathematics department, our goal is to create a learning culture that supports and encourages deep engagement with multiple demonstrations and modeling effective problem solving. We continually design teaching/learning events that take place in a constructivist classroom where students have the opportunity to develop their skills and construct knowledge. Our main focus is the conceptual understanding of mathematics and not just the memorization of the rules. The i²Flex methodology has enabled us to transform our math classes into learning hubs where teaching and learning is a continuous challenge.

The i²Flex methodology and its plasticity allow us to use a plethora of activities that take place inside or outside the math classroom and the Math Studio. These activities will be illustrated and fully explained below in this chapter.

THEORETICAL FRAMEWORK

Blended learning is a practical framework that can be used to encapsulate a range of effective approaches to learning and teaching. It encourages the use of contemporary technologies to enhance learning, and

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