

SMART Implementation Ideas for iTEC Cycle 2

1. MATHEMATICS IN A MULTICULTURAL SETTING

I am a teacher in an International School in Spain participating in the iTEC pilots for SMART and I have colleagues in Germany who are also participating in SMART's pilots for iTEC.

In my school, we want to strength our students Math and English language skills by getting students to think about Math in English. Students form teams (see activity 1), and begin their math course by uploading SMART Notebook software lesson activities (.notebook files) for each topic to be covered this year in Math class to the class Moodle. There they enter explanations of math concepts they are familiar with in English. For topics they are completely unfamiliar with, they add links to online material that explain the concepts in Spanish.

The students continue by gathering guides, videos, exercises and other resources online that relate to the topics they need to learn about (see activity 3). Using SMART Notebook 11 software they can directly embed web content into the lesson activities. As the students find online materials in English, they can embed them into the files on the class Moodle site. In effect, the students are compiling a single repository of English language mathematics learning materials by mixing content from a variety of sources and annotating it with their own notes and examples using SMART Notebook 11. They can also directly record their own verbal explanations for concepts in the .notebook files and in doing so can also offer regular audio updates (see activity 4). I support the data gathering by preparing the students, giving them starting points for their web searches, and monitoring the work uploaded to Moodle.

The students prepare short presentations out of the lesson materials they have accumulated and developed. The presentations include a Q&A session. We connect to another classroom in a German school using SMART Bridgit. My students present their results to other students in English and receive feedback from the German students in English also. I work with the German teacher to support the communication and sort out misunderstandings (see activity 5). Similarly, the German students give presentations and my students give them feedback.

I work with the German teacher to split both classes into virtual teams that span both Spain and Germany. We give both classrooms access to a common Moodle environment that the virtual teams will use to collaborate. Together, students from both Spain and German reflect on their understanding of the concepts by grouping information visually in SMART Notebook (see activity 6). SMART Notebook Math Tools like equations, tables and graphs let them use mathematics as a common language to ensure they understand everything correctly, as well as English.

Each virtual team creates a short quiz in SMART Notebook with SMART Response questions to test their understanding. Virtual teams then trade quizzes, and give their feedback (see activity 2 and 5). Where possible, the questions are based on concrete situations, such as information from their own classroom, numerical facts from their home countries, etc. Finally, the results of each team are shared with others in the class (see activity 7).

2. EMBEDDING EXAM PREPARATION IN LEARNING ACTIVITIES

After each lecture, it is my students' homework to create resources based on the topics discussed in class. I instruct the students on the types of resources that are most appropriate for each topic. These may include:

- exam questions (using SMART Response VE)
- crossword puzzles
- pictures, videos, podcasts and websites embedded in .notebook files
- mind maps (created with SMART Ideas)
- collaborative wiki notes on their Moodle environment

These resources are stored in online services that are most suitable, and linked to from our course home page. The resources are available to students from several classrooms in various cities. All students try and test resources made by others, give feedback in form of suggestions, and vote for the best resources (see activity 5). Resources are then further edited, either by the original author, or in collaboration with others.

Students document their work using SMART Notebook. I follow my students by listening to their audio updates (see activity 4) that they recorded direction into SMART Notebook 11. Most of the time, I let the students help each other, but instruct them on how to critically browse for and evaluate online information, and how to gather data online (see activity 3). During the course, we use post-it notes and list all topics of the course and all of our resources to see both relate to each other. This helps the students identify missing areas of the subject matter (see activity 6).

Students use the Moodle environment to upload their .notebook files and let others know about their new project works and works in progress. There the students also negotiate about ad-hoc collaborative sessions with other students from around the country and internationally. These collaborative activities can address the curricula of many courses (history, foreign language, geography) simultaneously (see activity 2 and 7).

3. STUDENTS CREATING SCIENCE RESOURCES

I want my students to become more interested in science topics, and decide to ask them to create exhibits that they show to younger students of other schools.

I start with a formative test I made in SMART Notebook that I give to the students

using SMART Response VE to evaluate how much they know about the course's topics. I go over the results with the class but not to teach them per se, but rather to small heterogeneous teams that mix different expertise (see activity 1). Each team works on one science concept and produces an exhibit that illustrates it.

To support the students, I give them pointers to various resources, including people and related events (see activity 2 and 3). They browse and learn together and teach one another. They try different ways to teach the concepts, give each other feedback, and choose those that seem to work best based on a map that visualizes out the findings of their trials concretely (see activity 5 and 6). Based on these experiences, they construct their "virtual science museum exhibit" (see activity 7). Students use SMART Notebook as a container/composer for the media in their exhibit. One page in their .notebook file is a poster to introduce the concept; another page describes a one physical experiment for it; another page embeds a web widget with a virtual simulation of the experiment; finally, the last page synthesizes the results in whatever way appears to the team. I have seen students create a video recording of a lecture, a rap song, or even a puppet play! Each group also creates a few sample problems in the form of a SMART Response VE assessment at the end of their .notebook file to accompany their exhibit.

I encourage the students to use the Moodle environment or a DropBox folder to routinely share their .notebook files with mean their team members. I monitor team progress and ensure that their productions are accurate and complete (see activity 4). In some cases, I suggest improvements usually by leaving a short note in their .notebook file.

When the exhibits are ready, each team finds students of a lower grade that would be interested in learning the concepts, and work with them and their exhibit to teach them (see activity 2).

After the course I can use the exhibits and sample problems created by the students to prepare year-end subject reviews, and later use the resources to spice up my courses.