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Scratch Educator Conversation 3: Integrating Scratch in the Curriculum

Ai Boon (Singapore), Frank (Spain), Karen (USA), Olga (Greece), Rana (Saudi Arabia)

Question: How can Scratch be integrated into the elementary school curriculum?

How do we use Scratch in schools? In some schools programming is not a requirement so we have to integrate Scratch with other topics in order to fit it into the school day. Some members of the group disagreed with this approach, though. We had a fine debate on whether Scratch should stand on its own as means for creative student explorations or be a tool used to help them understand concepts in subject areas.

Frank shared the following quote from Seymour Papert's *Mindstorms*, where he is writing about Logo.

For example, one could think of the Turtle as a device to teach elements of the traditional curriculum, such as notions of angle, shape and coordinate systems. And in fact, most teachers who consult me about its use are, quite understandably, trying to use it in this way. Their questions are about classroom organization, scheduling problems, pedagogical issues raised but the Turtle's introduction, and especially, about how it relates conceptually to the rest of the curriculum. Of course the Turtle can help in the teaching of traditional curriculum, but I have thought of it as a vehicle for Piagetian learning, which to me is learning without curriculum.

Frank argued in favor of having no particular content during Scratch classes, with kids learning by exploring the environment and setting their own challenges. Rana agreed that it is important to let students play. Frank said Scratch's power is in testing and trying, to let them learn how to learn.

Ai Boon and Karen were interested in how Scratch gets used in support of other learning. Karen noted that there is lots of pressure in some places to teach to certain standards, often with the number of minutes to spend in each subject area spelled out. Her school does not have a separate programming/technology class so she has to find a way to integrate it into other subjects in order to fit it in at all. She teaches math and uses Scratch to help students understand concepts in geometry and probability.

Scratch is a great tool for helping kids learn other things. Ai Boon had a student who needed to improve her reading for an exam. She made a project where she recorded her reading several times in Scratch, each time getting more fluent. Then she made animations to go with what she read.

Olga agreed with that instead of either/or, the goal can be “and”. She teaches a technology class using Scratch to help students learn about programming, but is also interested in how the programming becomes a tool for students to solve other problems.

We talked about ways that teachers integrate Scratch. It is common that teachers give handouts walking through projects, or kids work on a problem with partners using Scratch as a tool. One history teacher had students studying Mesopotamia make projects with an image from that time period, like ziggurats, then program data dots. When the user clicked the dots, they got a fact about the ziggurat. There are many demonstration projects on the Scratch website, where educators use Scratch to show how a concept in math or physics works. The projects are more complex than an elementary student could make on their own, but the animations help them understand relationships the same way an experiment does.

That took us on a side trip conversation about how kids end up remixing complex projects without understanding how the programming works. For some teachers, this isn't a problem because they are working with the scripts in a self-directed way.

Do we need to introduce kids to scratch before using Scratch in math or geometry classes? Teaching Scratch basics adds time to a project. Having a base-line set of Scratch skills developed in technology classes would help other content area teachers embrace its use in their courses. Franks says that in technology classes the teacher and the kids are a community and sometimes the teacher does not know the answer. The role of teacher is not as much in having all the information but in helping students figure out the information themselves. Kids can be teachers for other kids also.

We wondered if using Scratch works in subject areas besides math and science. Is there any value for reading or language lessons through scratch teaching, for example? By programming a language game (eg hello in different languages) kids have to acquire some language knowledge.

At the end, we didn't reach an agreement about integrating Scratch versus using Scratch for its own sake in schools. The importance of the thinking, design, and debugging work is clear to us, but the curricula of some school systems support technology as a tool to be integrated rather than a course on its own.

Some galleries with sample projects integrating Scratch with other subject areas

General:

<http://scratch.mit.edu/galleries/view/11876>

<http://scratch.mit.edu/galleries/view/61011>

Math:

<http://scratch.mit.edu/galleries/view/72273>

<http://scratch.mit.edu/galleries/view/43847>

Science:

<http://scratch.mit.edu/galleries/view/15003>

<http://scratch.mit.edu/galleries/view/25424>

<http://scratch.mit.edu/galleries/view/57515> (physics)

<http://scratch.mit.edu/galleries/view/54149> (physics)

<http://scratch.mit.edu/galleries/view/61172> (physics)

<http://scratch.mit.edu/galleries/view/39235> (environment)

Maps:

<http://scratch.mit.edu/galleries/view/53737>

Art:

<http://scratch.mit.edu/galleries/view/25427>

Journalism:

<http://scratch.mit.edu/galleries/view/7512>

Reading/writing:

<http://scratch.mit.edu/galleries/view/61659>

<http://scratch.mit.edu/galleries/view/9706> (book reports)

<http://scratch.mit.edu/galleries/view/43297> (Scratch e-books)

<http://scratch.mit.edu/galleries/view/37347> (Aesop's fables)

Multiple languages:

<http://scratch.mit.edu/galleries/view/60538>

<http://scratch.mit.edu/galleries/view/54923> (projects with numbers in many languages)