

opocopo

**An Open Platform for Online
Community of Practice Organization**

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1. Introduction

Scratch is a new programming language that enables users to easily construct a wide variety of interactive projects. From community narratives to role-playing games to mathematical simulations to consciousness-raising presentations, the potential for creative production with Scratch is boundless. However, for those who are primarily concerned with assisting others' Scratch learning, there is a disconnect between what individuals want to be able to do and the tools that are presently available to them.

Since joining the Lifelong Kindergarten group, I have had the opportunity to meet some of these people. They occupy a range of roles as teachers, researchers, parents, and hobbyists. Their interests in supporting Scratch learning are similarly diverse: a teacher who wants to share stories about Scratch and cross-curricular integration; a researcher who wants feedback on materials developed for exploring Scratch as participatory literacy; a parent who wants advice on how to introduce Scratch at a local all-girls high school; a hobbyist who wants to connect with others who have started Scratch groups for adults. These examples, which represent only a subset of individuals or groups who are interested in supporting Scratch learning, are shown along a two-dimensional spectrum of participation (Fig. 1). One dimension represents the context in which the individual situates the participation, from formal learning environments (e.g. a university) to informal learning environments (e.g. someone's home). The other dimension represents the individual's mode of participation, from organizer (e.g. curriculum designer) to participant (e.g. grassroots club member).

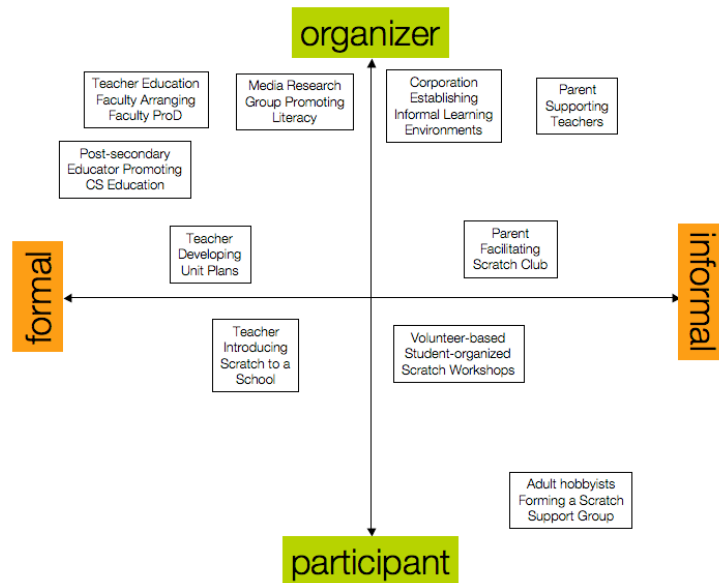


Figure 1: Spectrum of participation for individuals who want to support Scratch learning.

Currently, the Scratch website supports a subset of these interests and desires. The website offers: forums for questions, with a dedicated forum for educators; a page for educators, which has links to videos, reference materials, and writing; links for email-based support. These resources have demonstrated value, as they have (to varying extents) supported a community of more than 50,000 registered members, but they are insufficient to fulfill the needs of the individuals who are represented in Figure 1.

Using the lens of situated learning, learning occurs through processes of participation that are inextricably connected to and located within a particular context (Brown, Collins, Duguid, 1996; Engeström, 1991). Theorizing learning as a situated practice (with notions of *communities of practice* and *legitimate peripheral participation*) suggests that it is not sufficient to simply add additional forums, materials, and pages to the Scratch website. Rather, an environment separate from the Scratch website is needed to support the range of activities involved in supporting Scratch learning.

Participation is not a uniform construct, and experiences of participation vary from person to person. This variability in participation is what Lave and Wenger (1991) described as *legitimate peripheral participation*, which is a way to think about how new participants to a practice cultivate capacities via their interactions with fuller participants. The context in which these interactions take place are described as *communities of practice*. Communities of practice are relations between people, action, and tools characterized by three processes: *mutual engagement*, *joint enterprise*, and *shared repertoire* (Wenger, 1998). The processes of *mutual engagement* emphasize the community. Who are we as a group and how does that enable us to achieve our collective goals? The processes of *joint enterprise* emphasize the domain of the community. What practice are we interested in and what do we want to achieve? The processes of *shared repertoire* emphasize the resources of the community. What resources and repertoires do we cultivate to enable our practices? These community of practice processes are interconnected (Fig. 2):

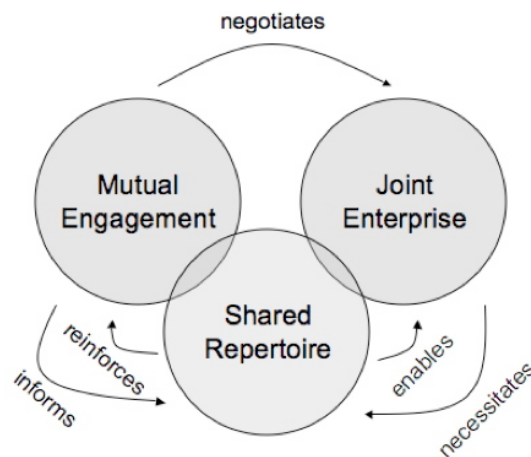


Figure 2: Processes of communities of practice (Brennan, 2007).

If we think about the Scratch group described above as a separate community of practice, we can see that it has a different domain or enterprise. The practice of the main Scratch site is producing Scratch projects. The practice of the group that supports Scratch learning is enabling the production of Scratch projects. While there is overlap between these two groups, they are not identical and members of each group may be deprived the opportunity to legitimately enter into fuller practice, as there is no obvious trajectory of participation between the groups. Barriers (either intentional or unintentional) to legitimate participation disrupt the processes of communities of practice, preventing the achievement of practice-related goals. Thus, returning to the issue of separating from or extending the main Scratch site, a separate site would enable individuals who want to support Scratch learning to cultivate desired relationships, practices, and resources.

Pursuing the premise that a separate site is required, a question regarding implementation looms. Is ScratchR, which is the platform for sharing user-generated programmable media on which the Scratch website is built (Monroy-Hernandez, 2007), sufficient to accommodate the community of practice for enabling Scratch learning? Again, using the community of practice processes perspective, I would argue that ScratchR is not sufficient for this task. While ScratchR has been very effective for enabling the Scratch community to engage in the practice of creating and getting support for creating Scratch projects and socially networking, it is less effective for the explicit organization of a community of practice. For example, participants need to be able to talk and share stories about the practice, and while this is achieved somewhat through project notes and on the forums, it is clearly secondary to the central focus of project production. Although there exist numerous platforms for distributing content, there is a gap in available platforms (and design strategies for such platforms) that enable communities of practice to engage in explicit self-organization around learning (Barab, 2003; Schwen and Hara, 2003).

In this work, I propose **opocopo**, an **open platform for online community of practice organization**. This platform enables users to organize a community of practice around the processes of mutual engagement (community), joint enterprise (domain), and shared repertoire (resources) by sharing stories, resources, discussions, and events. In the next section, I describe existing sites and platforms that support communities of practice and how they contributed to my thinking about the need for a different platform. In the third section, I present the principles that informed the design and how the design actualizes those principles. In the fourth section, I present a walk-through of the platform from the user's perspective, in the particular case of a community of practice concerned with helping people learn Scratch. In the final section, I discuss future work for the project.

2. Existing approaches

Numerous sites and platforms exist that support community of practice processes. Some sites and platforms enable users to share their experiences, while others allow users to articulate a domain of interest or cultivate resources for the interest or practice. Using the dimensions of mutual engagement, joint enterprise, and shared repertoire, I examine several sites and discuss the ways in which the dimensions were supported (or not) and what attributes of the site inspired *opocopo*.

Meetup

<http://www.meetup.com/>

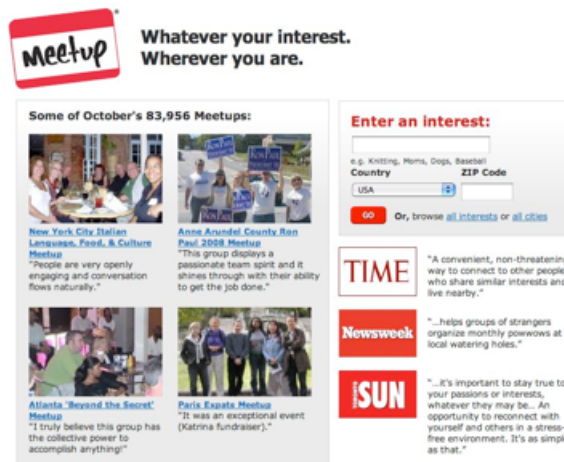


Figure 3: Meetup.

OER Commons

<http://www.oercommons.org/>



Figure 4: OER Commons.

Meetup enables individuals to find or build local community around a practice of interest (Fig. 3). It shares information about the members of a community, with a focus on their community participation.

While it connects people to others, thus developing a face-to-face community, there is little emphasis on sharing stories about the practice, providing access to resources for the practice, or negotiating aspects of the practice.

OER Commons offers users access to a large repository of curricular materials and resources (Fig. 4). Users are also able to submit their materials to the site, which acts as an aggregator.

By providing a homogenizing interface to access resources, the materials are decontextualized from their original practices. While users can provide descriptions, comments, and reviews, stories about how the resources were used in a particular community of practice are absent.

Learn Scratch

<http://learnscratch.org/>

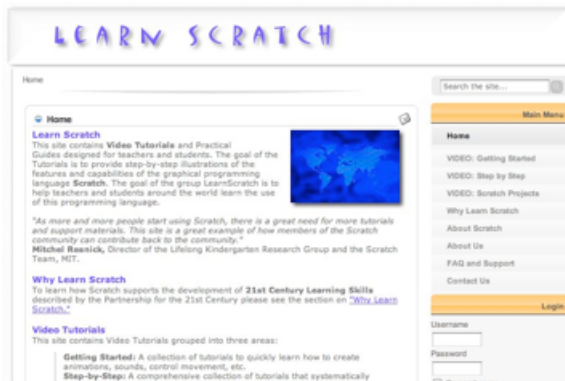


Figure 5: Learn Scratch.

Learn Scratch provides resources for learning Scratch (Fig. 5). The site includes numerous video tutorials, as well as a philosophical orientation about why it is important to learn Scratch.

The site has a minimally participatory presentation, resulting in a didactic rather than community impression.

Knowledge Networks On the Web

<http://know.umich.edu/>

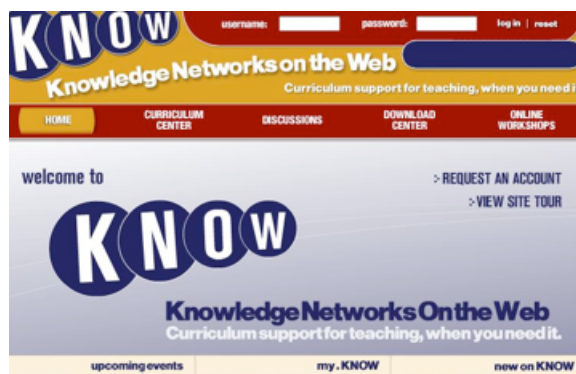


Figure 6: Knowledge Networks On the Web.

KNOW connects teachers who are exploring inquiry-based approaches to science education with researchers, curriculum, and peers (Fig. 6).

KNOW is intended for explicitly formal learning environments. Participation is limited and does not permit casual, unauthenticated browsing

Exhibit Files

<http://exhibitfiles.org/>

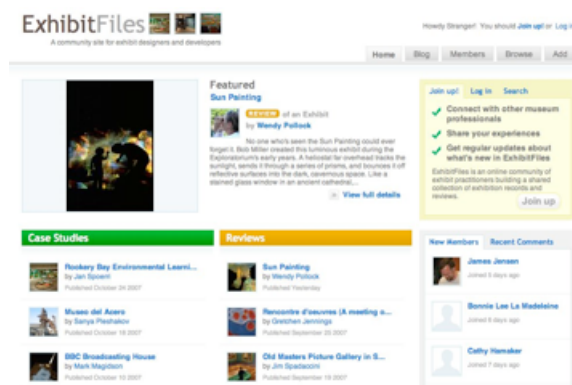


Figure 7: Exhibit Files.

Exhibit Files connects exhibit designers and developers through exhibit case studies and reviews (Fig. 7). There is an emphasis on identifying members and their stories, as well as talking about and thinking through the practice more broadly.

The site is expert-oriented, and the progression of newcomers to fuller participation through the site is not evident.

3. Proposed Design

The *opocopo* platform is designed to cultivate online environments in which it is easy to participate in community of practice organization. All aspects of the platform are oriented about the community member. The platform consists of four participatory modules: stories, materials, discussions, and meetups (Fig. 8).



Figure 8: *opocopo* participatory modules.

Stories

Documenting the stories of a community serves multiple purposes. First, an individual that shares her/his stories makes it possible for other community members to know him/her, which strengthens the connections between individuals in the group. Second, a history of the practice is recorded. This history allow members to negotiate the trajectories of the practice, and respond accordingly by developing new resources and routines.

Materials

All communities of practice need tools and routines to achieve practice-related goals. By having access to infrastructure that catalogs these enabling materials, both new and fuller members can participate in the practice. Given the diversity of a community's repertoire and members' participation, this module accommodates multiple forms of materials, from text documents to multimedia productions.

Discussions

While all parts of the platform will be conducive to collaboration, the discussions module will be a place in which conversation can take place beyond what is incited by a particular story, material, or meeting. This is intended to be a space where new participants can seek guidance about the community and its practices from fuller participants, and fuller participants can articulate visions of the community's future trajectories.

Meetups

Part-map and part-calendaring system, the meetups module provides a connection to the physical world. Communities of practice do not occur in isolation or, in the case of online communities, exclusively in virtual spaces. Members will be able to share and view practice-related events with members of the community.

Profile

Each community member will have access to a personal profile. In this personalized location, the participant will be able to customize his/her public profile, track and extend her/his community contributions, and organize connections to other members.

Administration

opocopo is a platform that could be used for any community of practice that is interested in participating in self-organization. Given this inherent diversity, *opocopo* will be modular and open-source, so that it is easy for administrators to extend or restrict the functionality accessible to community members. To promote inclusivity in participation, *opocopo* will also be designed to support accessibility and localization.

4. Design Scenarios

In this section, I present the user interface design of *opocopo* and how this design supports participation. I describe a walk-through of the platform from the user's perspective, using the particular case of a community of practice concerned with helping people learn Scratch.

Meet Hiroko Kojima, an after-school program design manager. Meet Lana Hall, a computer science instructor at a college. Meet Jeff Halp, an 8th-grade language teacher. Meet Dai Hara, a parent of three elementary-age children. Meet Lauren Trey, an education graduate student. While all five have different roles and responsibilities, they have a common interest: enabling others to learn Scratch. To achieve this, they need access to a community of practice that makes processes of learning explicit (Fig. 9).

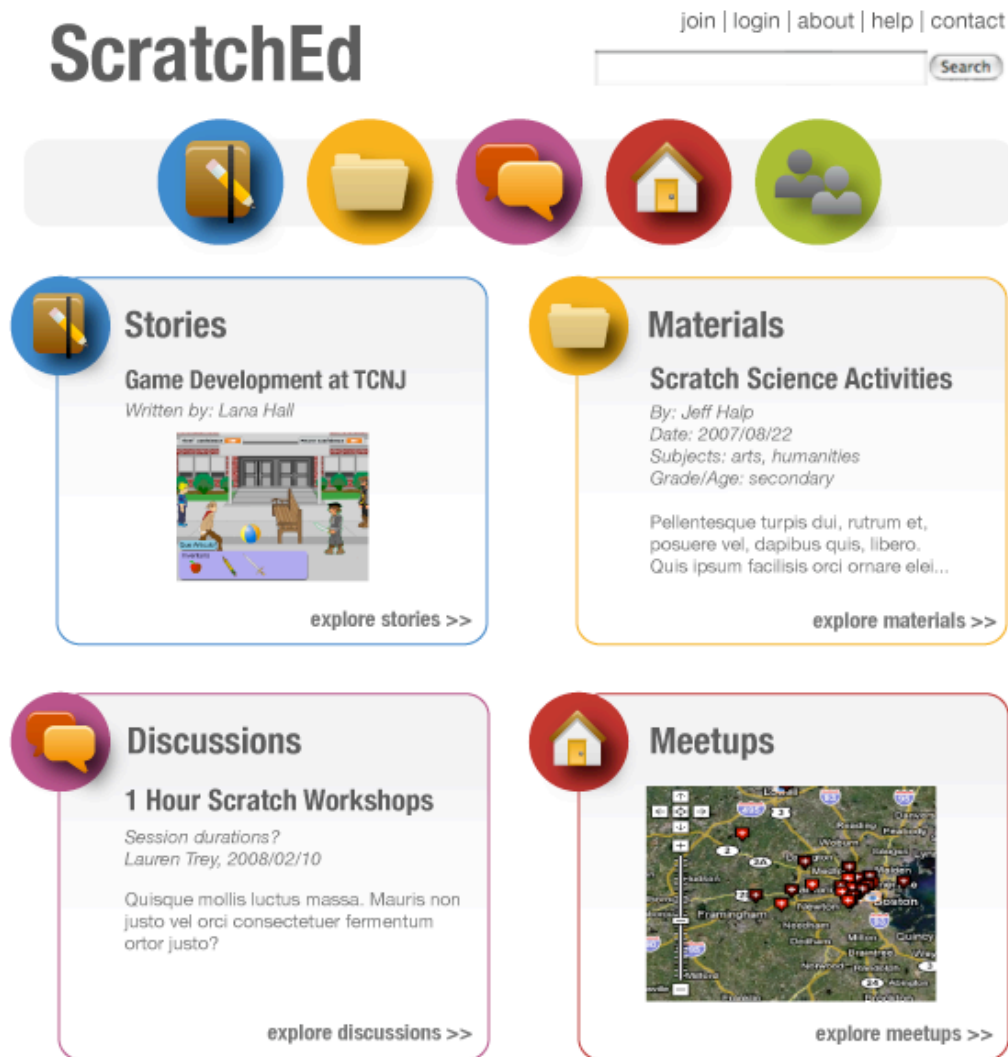


Figure 9: ScratchEd home page.

Hiroko manages a network of after-school programs. She wants to introduce Scratch to the network, but wants to hear others' stories of using Scratch in informal learning environments. When she visits ScratchEd, she is able to browse through community members' stories and search for relevant stories using tags (Fig. 10). She finds two stories that are particularly relevant; one is a written story and the other is a video.

The screenshot shows the ScratchEd website interface. At the top, there is a navigation bar with links for "join | login | about | help | contact" and a search box. Below the navigation bar is a horizontal row of five circular icons: a blue circle with a book and pencil, a yellow circle with a folder, a purple circle with two speech bubbles, a red circle with a house, and a green circle with three people. The main content area is divided into two sections. The first section features a featured story titled "Game Development at TCNJ" with a small icon of a book and pencil. The story is written by Lana Hall and posted on January 30, 2008. The text of the story is a placeholder Latin text. To the right of the text is a screenshot of a Scratch game titled "Thief Confabance" and "Pirate Confabance". The game shows a character in a brown coat and hat walking through a town square. There is a "Que Artículo?" button and an "Inventario" (Inventory) window showing an apple, a pencil, and a sword. Below the featured story is a "view entire »" link. The second section is a grid of four story browsing options. Each option consists of a small image, a title, the author's name, and the date. The options are: "Education 2.0" by Dai Hara (2008/02/15), "Club in Costa Rica" by Lauren Trey (2008/01/14), "Clubhouse Workshop" by Jeff Halp (2008/01/26), and "H2O Community Themes" by Hiroko Kojima (2008/03/18). At the bottom right of the grid is a pagination control with arrows and the numbers 1, 2, 3, and 4.

Figure 10: Story section, with featured story and story browsing.

Lana has been using Scratch for rapid game prototyping with computer science undergraduates. She shares the successes and challenges of her work and posts several sample projects (Fig. 11). Lana receives feedback from members of the community through comments and private messages. Through these collaborations, she learns about similar endeavors that are currently underway and she makes changes to her practice.

[lanahall](#) | [about](#) | [help](#) | [contact](#)

ScratchEd

Search

Game Development at TCNJ ✍️ ❤️

Written by: Lana Hall
Posted: January 30, 2008

Duis tortor justo, vehicula quis, ultricies ac, rhoncus in, urna. Donec laoreet porttitor velit. Quisque vitae lectus. Morbi adipiscing. Integer viverra molestie lectus. Pellentesque turpis dui, rutrum et, posuere vel, dapibus quis, libero. Mauris quis ipsum facilisis orci ornare eleifend. Quisque mollis luctus massa. Mauris non justo vel orci consectetur fermentum ortor justo, vehicula quis, ultricies ac, rhoncus in, urna. Donec laoreet porttitor velit. Quisque vitae lectus. Morbi adipiscing. Integer viverra molestie lectus. Pellentesque turpis dui, rutrum et, posuere vel, dapibus quis, libero. Mauris quis ipsum facilisis orci ornare eleifend. Quisque mollis luctus massa. Mauris non justo vel orci consectetur fermentum. ortor justo, vehicula quis, ultricies ac, rhoncus in, urna. Donec laoreet porttitor velit. Quisque vitae lectus. Morbi adipiscing. Integer viverra molestie lectus. Pellente turpis dui, rutrum et, posuere vel, dapibus quis, libero. Mauris quis ipsum facilisis.

Keywords: tortor, vehicla, integer, libero

Comments

💬 Session durations?
Lauren Trey, 2008/02/10

Quisque mollis luctus massa. Mauris non justo vel orci consectetur fermentum ortor justo?

Members who bookmarked this

Dai Hara

Lauren Trey

Email
 Delicious
 myYahoo
 Google
 Magnolia
 Digg
 reddit

Figure 11: Detailed story view, with media browsing, comments, and bookmarks.

Jeff teaches languages at a middle school and encourages students to use Scratch for interactive presentations. Other teachers have been inspired by his work, and he creates a series of Scratch-based cross-curricular activities. Hoping that others will use – and provide feedback on – his materials, he posts them to ScratchEd. He wants to find others who have created similar activities and uses the search functionality to find subject, age, and implementation-specific materials (Fig. 12).

ianahall | about | help | contact

ScratchEd

Search

Materials

Scratch Science Activities
 By: Jeff Halp
 Date: 2007/08/22
 Subjects: arts, science
 Grade/Age: secondary

Math & Scratch Poster
 By: Dai Hara
 Date: 2008/01/12
 Subjects: mathematics, science
 Grade/Age: primary

1 2 3 > >>

Subjects	Grade/Age	Type
<input type="checkbox"/> arts	<input type="checkbox"/> primary	<input type="checkbox"/> activities
<input type="checkbox"/> business	<input type="checkbox"/> secondary	<input type="checkbox"/> assessments
<input type="checkbox"/> computing	<input type="checkbox"/> post-secondary	<input type="checkbox"/> lecture notes
<input type="checkbox"/> engineering		<input type="checkbox"/> lesson plans
<input type="checkbox"/> humanities	Featured	<input type="checkbox"/> unit plans
<input type="checkbox"/> mathematics	<input type="radio"/> yes	<input type="checkbox"/> syllabi
<input type="checkbox"/> science	<input type="radio"/> no	<input type="checkbox"/> readings
<input type="checkbox"/> social sciences	<input checked="" type="radio"/> either	<input type="checkbox"/> training
<input type="checkbox"/> technology		<input type="checkbox"/> recruitment
		<input type="checkbox"/> projects
		<input type="checkbox"/> student work
		<input type="checkbox"/> other

Keywords

Search

Figure 12: Materials section, with search functionality.

Dai wants to help his children start a Scratch club at their school. He searches for relevant materials on ScratchEd and finds a collection of useful documents, from participation permission forms and promotional signs to unit and lesson plans. He also wants to learn Scratch to help out and he finds materials that the Scratch Team have created that support his own learning (Fig. 13).

ianahall | about | help | contact

ScratchEd

Search

Scratch Reference Guide  

Written by: Scratch Team
 Posted: December 1st, 2007
 Subjects: arts, mathematics, social sciences
 Grade/Age: post-secondary
 Type: readings, other


Links

- [Scratch Reference Guide v1.2](#)
- [CS3 InDesign documents](#)

Description

Pellentesque ut neque non nunc gravida adipiscing. Fusce mattis, metus ut semper placerat, magna orci rhoncus velit, ac hendrerit felis lacus sit amet neque. Sed libero erat, pretium nec, tempus id, iaculis et, sem. Ut fringilla auctor ante. In malesuada lacus id dolor. Aliquam erat volutpat. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam augue eros, imperdiet quis, iaculis ac, elementum id, sapien. Cras venenatis viverra urna. Cras velit velit, vulputate id, auctor ut, fringilla nec, sem. Nulla nisl. Maecenas porta, nisi eget tempor odio.

Comments

 Music rest blocks
 Jeff Halp, 2007/12/05
 Quisque mollis luctus massa. Mauris non justo vel orci consectetur fermentum?

 Point in direction?
 Lauren Trey, 2007/12/10
 Quisque mollis luctus massa. Mauris non justo vel orci consectetur fermentum? Phasellus semper ante eget pede malesuada pellentesque. Fusce pretium nonummy nulla. Nulla vestibulum.

Members who bookmarked this

 Hiroko Kojima

Email Delicious myYahoo Google Magnolia Digg reddit

Figure 13: Detailed materials view, with materials links, comments, and bookmarks.

Lauren is considering using Scratch with the pre-service teachers that she works with as a graduate student, but she hasn't found any stories on ScratchEd about experiences in teacher education. She posts a message to the discussion forums (Fig. 14). Over the course of a week, she has received numerous responses and has a clearer idea about how she could integrate Scratch into an education program.

ianahall | about | help | contact

ScratchEd

Search

Discussions

	# Topics	# Posts
Topic 1	17	213
active thread 1		
active thread 2		
Topic 2	7	58
active thread 1		
active thread 2		
active thread 3		
Topic 3	33	127
active thread 1		
Topic 4	5	27
active thread 1		
active thread 2		

Figure 14: Discussions section, with currently active threads highlighted.

Hiroko wants to invite guest speakers to some of the after-school sessions that she manages, to talk about their experiences working with Scratch. She looks at the meetups maps and finds several people who work and live in her area that also work with kids and Scratch (Fig. 15). She contacts one of the people and they arrange reciprocal field trips for their participants.

The screenshot shows the ScratchEd website interface. At the top, the logo "ScratchEd" is on the left, and navigation links "ianahall | about | help | contact" are on the right. Below the logo is a search bar with a "Search" button. A horizontal bar contains five circular icons: a book, a folder, speech bubbles, a house, and a group of people. The "Meetups" section is highlighted with a red border and contains three event cards and a map. The event cards are:






- Scratch Conference**
Location: Cambridge, MA
2008/07/26
- Scratch @ CasaTelmex**
Location: Mexico City
2008/01/15
- WMS Scratch Club Party**
Location: Watertown, MA
2007/12/21

The map on the right shows the Boston area with several red location pins. At the bottom of the Meetups section are navigation arrows: a double left arrow, a single left arrow, a page number "1", a page number "2", a page number "3", a single right arrow, and a double right arrow.

Figure 15: Meetups section, with event calendar and map.



Lana wants to connect with other people working in higher education. Using ScratchEd's calendaring function, she learns that the Scratch Team is hosting a plenary session about connecting Scratch to computer science curricular outcomes (Fig. 16). She registers for the event, which enables her to meet face-to-face with like-minded individuals. At the event, she makes a wide variety of connections with people and she continues to communicate with them via ScratchEd.

ScratchEd ianahall | about | help | contact



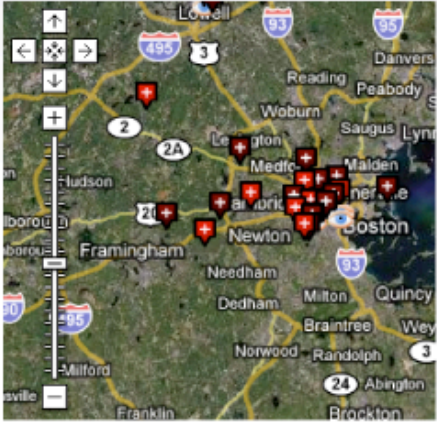
Event Name

Created by: Scratch Team
Location: The Place
Date: December 1st, 2007
Organization: The Group
Cost: \$10
Tags: readings, other




Description

Pellentesque ut neque non nunc gravida adipiscing. Fusce mattis, metus ut semper placerat, magna orci rhoncus velit, ac hendrerit felis lacus sit amet neque. Sed libero erat, pretium nec, tempus id, iaculis et, sem. Ut fringilla auctor ante. In malesuada lacus id dolor. Aliquam erat volutpat. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam augue eros, imperdiet quis, iaculis ac, elementum id, sapien. Cras venenatis viverra urna. Cras velit velit, vulputate id, auctor ut, fringilla nec, sem. Nulla nisl. Maecenas porta, nisi eget tempor odio.





Comments

 Session durations?
Lauren Trey, 2008/02/10

Quisque mollis luctus massa. Mauris non justo vel orci consectetur fermentum ortor justo?

Members who bookmarked this


Dai Hara


Lauren Trey



 Email Google

Figure 16: Detailed meetups view, with comments and bookmarks.

Jeff feels committed to supporting new members of the ScratchEd community. He likes to see who has recently joined and send them a welcoming note (Fig. 17). He regularly encourages his colleagues to join the site, so he also searches for particular names to learn if someone he knows has joined the site.

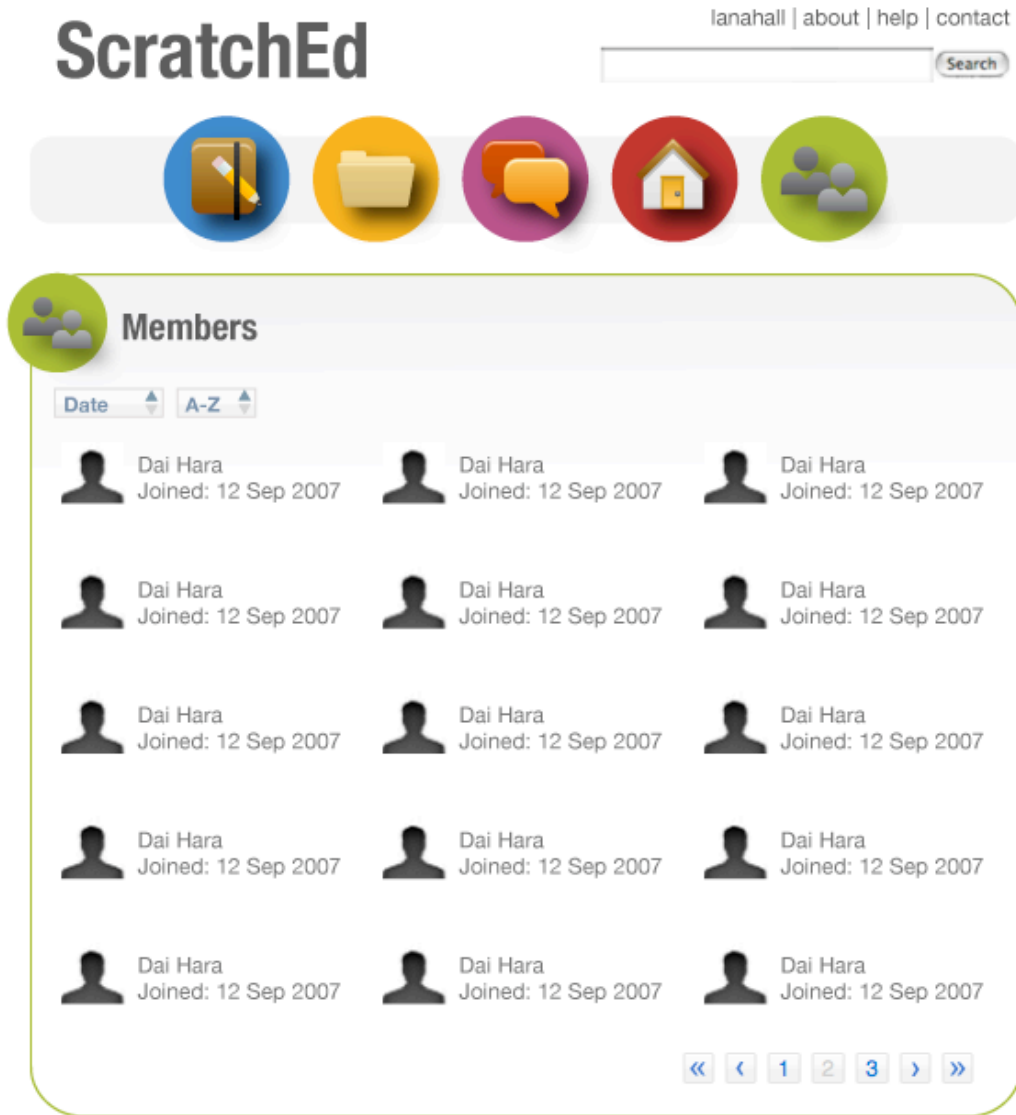


Figure 17: Members section.

Lauren has started regularly contributing and tracking materials on the site. She visits her profile page to update her public profile, edit her contributions, and manage her bookmarks and contacts (Fig. 18). When others visit her page, they learn about her interests and how to contact her. They also find in-site contacts that she's bookmarked as interesting, which builds up a network of connections.

lanahall | about | help | contact

ScratchEd

Search

Lauren Trey

Joined: January 30, 2008
 Location: Palo Alto, CA, USA
 Birthdate: May 1973

Organization: Stanford University
 Email: lauren.trey@gmail.com
 URL: http://www.stanford.edu/group/adolescent.ctr/

Interests:
 Duis tortor justo, vehicula quis, ultricies ac, rhoncus in, urna. Donec laoreet porttitor velit. Quisque vitae lectus. Morbi adipiscing. Integer viverra molestie lectus. Pellentesque turpis dul, rutrum et, posuere vel, dapibus quis, libero. Mauris quis ipsum facilisis orci ornare eleifend. Quisque mollis luctus massa. Mauris non justo vel orci consectetur fermentum tortor justo, vehicula quis, ultricies ac, rhoncus in, urna.

Contributions

All Posted Date A-Z

Humanities Conference
 Location: Somewhere, MA
 2008/05/05

Community Lesson Plan
 2008/03/19

Team Computer Use
 2007/12/25

Bookmarks Contacts

All Date A-Z

Scratch Reference Guide
 By: Scratch Team
 2008/03/02

Games at TCNJ
 By: Dai Hara
 2008/02/15

Intro Video
 By: Jeff Halp
 2008/01/21

Figure 18: User page, with profile, contributions, bookmarks, and contacts management.

From her profile page, Lana is able to add new resources to the ScratchEd site. With one click, she is brought to the story template page, which allows her to share her Scratch stories (Fig. 19). She can connect her story to a variety of media.



The image shows the ScratchEd website header with the logo, navigation links (lanahall | about | help | contact), and a search bar. Below the header is a row of five circular icons representing different media types: a book, a folder, speech bubbles, a house, and a group of people. The main content is a story submission form with the following fields:

- Story Title:** Game Development at TCNJ
- Keywords:** narratives, assement, think-pair-share
- Content:** A text area containing two paragraphs of placeholder text (Lorem Ipsum).
- Media Links:** A list of three links, each with a minus sign icon and the URL <http://www.lorem.com/ipsum.html>.

At the bottom right of the form are two buttons: **Submit** and **Cancel**.

Figure 19: Story submission.

5. Future Work

This design brief documents my preliminary thinking about the *opocopo* platform. It is the product of numerous conversations with education graduate students, software engineers, practicing teachers at both the middle and secondary levels, and computer science educators. The next tasks to be undertaken are to develop an architectural view of the system from the user interface requirements, and then to create a project plan describing the required design and implementation activities.

While there are numerous content and learning management systems available to individuals or groups interested in connecting, there are no open platforms devoted to the organization of communities of practice. *Opocopo* has the potential to enable a wide variety of groups that support learning to cultivate their practices in an online environment, beginning with the Scratch learning community.

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