

# Encouraging Online Contributions in Underrepresented Populations

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**Abstract**—Research has revealed how actively contributing to online communities can advance technical skills, knowledge, and confidence, and ideas for sustaining and evolving participation. However, recent studies have also shown that contributors of online content are a small subset of the population using technical systems, and that this subset is not representative of the larger population. This trend is concerning both in terms of who takes advantage of opportunities to develop technological competencies necessary for participation in the 21st century, and in terms of who is authoring content that informs public opinion and knowledge. In this paper, we consider how Latino youth interact around online digital artifacts and how we can design features to better support their contributions of communication and critique. This work specifically attends to documented trends in formal learning environments in Latino communities, including emphasis on good behavior and respect for adult authority and less emphasis on individual autonomy. We focus on a collaboration with a seventh grade teacher using an online platform in a predominantly Latino middle school. We first describe student online communication and contribution, using qualitative ethnographic case studies and quantitative log data. We then share the collaborative design of *reactions*, a feature encouraging student contributions in the form of communication and critique. Findings suggest important cultural and pedagogical design considerations for online social learning network interfaces aiming to build learning community and engage diverse youth populations to contribute.

**Keywords**—Communities of learners, Middle school, Latino students, Critique, Blended learning, Social learning networks

## I. INTRODUCTION

As part of an ongoing effort to promote equitable participation in online communities for all youth, we present our work developing features of iRemix, an online social learning network for use in varied formal and informal 5-12 grade learning contexts. This online environment is designed to foster sharing and interaction around student digital media projects. Research questions for this study include: (1) How do Latino youth interact around submitted digital artifacts and (2) How can we design features to better support their contributions of communication and critique? In this paper, we address these questions through a detailed examination of the design of the *reactions* feature, which emerged through a collaborative research and development process with teachers and students. We report on two design iterations in authentic classroom settings and the design decisions that informed the iterative development. With a fundamental concern for encouraging equitable access to 21<sup>st</sup> century skill development for Latino students, we highlight important cultural and

pedagogical design considerations for social learning network interfaces that are meant to build learning community.

## II. RELATED LITERATURE

### A. Online contributions and 21<sup>st</sup> century skills

Inequities exist in terms of who has the opportunities to participate in programs and activities that can build technological competencies related to 21<sup>st</sup> century learning. Youth from areas with fewer socioeconomic resources are especially underserved [11, 20]. Networked online systems promise the potential for making connections between youth, learning activities, and learning resources that go beyond the boundaries of home, school, and neighborhood, building on the ideas behind communities of practice [8, 9]. Research has revealed how actively contributing to online communities can advance technical skills, knowledge, and confidence, and ideas for sustaining and evolving participation [2, 8]. Within such communities, sharing digital media, providing feedback and critique, and discussing topics of shared interest can foster 21<sup>st</sup> century competencies, as youth critically navigate online spaces and find supports for perseverance and learning [2]. While exact definitions vary, efforts to define 21<sup>st</sup> Century skills are similar in their attention to intrapersonal skills such as creativity, and interpersonal skills such as communication, critique, and collaboration [17, 18]. Recent K-12 standards for learning reflect these competencies and the widespread agreement on their importance for general public participation and the ability to meet today's workforce needs [14, 15].

### B. Issues of Equity

Despite the potential for online environments to build technological fluencies and form communities of learners, recent summaries of K-12 online learning opportunities reveal few conclusions, and stress need for more research in this area [12]. At the same time, studies have revealed that contributors of online content in general are a small subset of the population using technical systems, and that this subset is not representative of the larger population [6]. This trend is concerning both in terms of who takes advantage of opportunities to develop competencies necessary for productive participation in the 21st century, and in terms of who is authoring content that informs public opinion.

This and other work express a need to focus on unique online users and communities to understand what works, where, and for whom, as opposed to designing systems that assume that unique blended learning environments have similar goals, resources, or practices [7, 12].

### C. iRemix

iRemix is an online social learning platform [2], which has an interface and functionality similar to popular online social network communities. Youth and educators can create profile pages, link to peers, and share and critique work through blogs, forums, and debates. It is intended to support the development of 21<sup>st</sup> century learners through production, reflection, critique, and revision. To address the needs of particular learning contexts and communities, iRemix includes core components and customizable flexible, modular features.

## III. METHOD

### A. Context and Participants

To learn how iRemix supported communication and critique around digital artifacts, we engaged in authentic collaborative research and design. Here, we report on a middle school ELA teacher and his 56 students and their use of iRemix in the spring and fall of 2014 at an urban charter school. The K-8 school draws the majority of students from a predominantly Latino community: 91% of students are Latino, 8% black, and 1% white. 95% of these students are low income and over one third (35%) are English language learners.

### B. Data Collection and Collaboration

We engaged quantitative and qualitative strategies for understanding the system. The first year of our study involved: (1) the co-design of learning activities involving iRemix with the teacher, (2) the development of teacher case studies through classroom observations, teacher interviews focusing on learning goals, practices, and tool usability; and (3) descriptive analysis of iRemix log data, documenting student traces (e.g., posting and viewing work, commenting) over six months. The second year of data collection added (4) student-centered co-design activities, recruiting students as our design partners [3]. Throughout the study, design memos were written, documenting analysis and design decisions.

## IV. RESULTS

### A. Iteration 1: Open-Ended Commenting

The teacher was very interested in using iRemix to encourage his students to share work and communicate with each other around this work, seeing this as a way for them to express their ideas to each other and to receive formative feedback they could use for revision. In the first iteration (Fig. 1), students could communicate and critique by posting open-ended comments on digital project artifacts submitted by others (e.g., photos, blog posts, videos) accessed by browsing the activity feed, project assignment pages, or student profile pages.

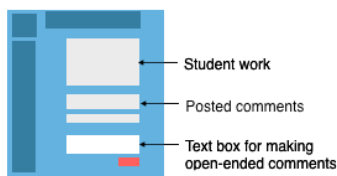


Fig. 1. Open-ended commenting design pattern in iRemix

a) *Existing Cultural Norms.* A distinct reason for the teacher's intentional use of iRemix for sharing and discussing work was to invigorate social participation with his particular student population. In an interview he stated:

*The culture here is they're very reserved, which allows for easier classroom management, I would say, but a different type of style. You really have to work to get kids to participate and raise their hands...most of the challenge is getting them comfortable enough to participate and speak in front of the class and share their ideas.*

Although it is important not to generalize in this work, there are documented trends across Latino communities that replicate these teacher observations. In terms of social and school learning, the Latino culture tends to emphasize good behavior and respect for adult authority [16, 19] and put less of an emphasis on individual autonomy [5].

Given these cultural norms, how can lively academic critique and commenting be encouraged? The teacher and research team co-created 11 assignments on iRemix prompting students to create and submit digital artifacts, ranging from poetry narrated in video, digital music, and still images. The teacher purposefully built in class time for students to view each other's work and leave comments using "constructive criticism," and commenting on the work of others was a requirement for two of the assignments.

b) *Use of iRemix for Communication and Critique.* The students recognized iRemix as a space for social interaction around project work. "It's a website, where you post videos and images, and you blog about things that you've worked on," "It's a website where you can share your work with your friends and your teachers." In this first iteration, student actions focused on sharing work and looking work of others as opposed to dialogue and communication around work.

Log data from the first iteration (six months of iRemix use) revealed that students posted an average of 28.4 digital artifacts (ranging from 15-54 posts) and viewed an average of 35.8 artifacts posted by others (ranging from 10-101 views). While most students commented at least once (91%) during this time period, the pattern of communication aligns with the two assignments requiring them to comment, suggesting that this was not their regular practice. Although all students submitted work beyond the required 11 assignments, the commenting was minimal: they contributed an average of 4.3 comments on the work of others (ranging from 0-11 comments).

c) *Evaluation.* These results from qualitative and quantitative data yielded a design opportunity. Both students and the teacher saw the learning network as a social space, but whereas students were more comfortable posting work and viewing the work of others, the teacher was interested in students presenting their ideas, providing encouragement, and posing questions online, since many students were shy in the face-to-face environment. Also, we know that contributing comments and critique around artifacts is a way to build a learning community whose participants share ideas and expertise, provide formative feedback, and learn through the critique of others [2, 8, 13]. The open-ended comment feature was not enough in this environment to activate a robust

exchange of ideas and expertise, regardless of the amount of work that was posted and consumed by the community.

### B. Iteration 2: “Reactions” Feature

a) *Developing the Structure.* In the second design iteration, we revised the interface to encourage more student communication and critique in a feature we call *reactions*. This revision still allowed students to comment on work, but added the ability for youth to easily contribute a quick reaction to the work by clicking on one or more pre-determined short phrases (Fig. 2). As students indicate reactions, they become visible wherever the artifact of work is displayed in the site along with counts indicating their frequency. This feature draws from design patterns [1] for social interaction found in social networking sites popular with youth, which utilize low-barrier ways of indicating interest with content, such as Facebook’s “like” button and BuzzFeed’s buttons which allows users to react to content using a set of options (e.g., LOL, OMG). Unlike in popular social networks, the reactions can be customized by each community, a key characteristic affording alignment with educator goals .

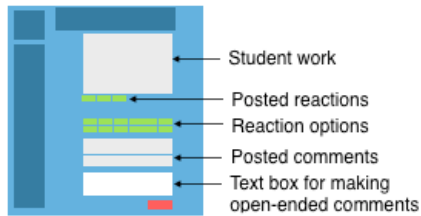


Fig. 2. “Reactions” design pattern in iRemix

b) *Designing the Content.* We involved students to inform the content of the reactions. During class time, two researchers held a 20-minute focus group and short design activity. The initial conversation asked students to talk about reasons they would leave comments on others’ work, prompting answers drawing on the school-based iRemix and other sites they used, including Vine and Instagram.

Researchers then showed two sample artifacts on iRemix, created by youth in their grade, and asked students to create potential reaction “tags,” with the constraint that they had to be less than five words. Students were given markers and Post-it notes and had five minutes to complete the task. After they generated at least three ideas, they applied their “tags” to printed representations of each design, and organized them into themes as a group. The researchers then prompted the group for clarifications.

The majority of the focus group discussion revolved around commenting as a way to offer and receive encouragement on work. Students reflected that when they received comments they felt happy to know that others liked their contributions, and “relieved” when they received compliments after posting. Encouragingly, this awareness of and attention to audience are indicators of participatory culture [8]. Some students also mentioned comments as a way to provide specific feedback or constructive criticism to peers. When asked if they ever used comments to ask how someone did something, students responded positively, but this was not a strong theme.

Youth preference for multiple modes of representation, including visual and graphical, is a finding in related design research [4]. Many of the tags that students created (Fig. 3) come from existing social network platforms, especially those focused on sharing digital artifacts. The most common reaction ideas were emojis, the ideograms used in Japanese electronic messages that are widely used in popular social platforms. Researchers sorted student tags into larger categories (Table 1),



Fig. 3. Sample of reactions created by students

TABLE I. SUMMARY OF REACTIONS CREATED BY STUDENTS

Reaction category	Unique tags	Total tags
<b>General encouragement</b> E.g.: Emojis, <i>Cool, Awesome, Good work</i>	32	172
<b>Specific positive remarks</b> E.g.: <i>Great details, Creative</i>	7	28
<b>Sharing or saving</b> E.g.: <i>Share, Add to favorites</i>	4	18
<b>Suggestions for improvement</b> E.g.: <i>More detail needed, Factual Errors</i>	4	13
<b>Appreciation for learning</b> E.g.: <i>How did you do that?, Got it</i>	5	6
<b>Somewhat negative</b> E.g.: <i>Bruh?, Not even</i>	3	6

Twelve reactions were selected for implementation into iRemix for this school environment. Decisions for selecting (and rejecting) student-generated *reactions* were based on the idea that responding to cultural identity [10] and compatibility with current practices [13] is needed to engage students, encourage new behaviors, and shift norms. Thus, we worked with the classroom teacher to chose reactions to align with the student-generated weighted categories, but also with actions recognized as important in developing online learning communities and other capacities related to 21<sup>st</sup> century learning we are interested in supporting (Table 2). These included designing for boundary crossing in and out of school to promote interest-driven engagement and creative identities [16], and fostering awareness of and care about audience reactions to individual contributions to support growth of participatory culture [8]. As such, we selected reactions that: (1) were positive and fun at this early stage of the learning community’s development; (2) used familiar language; and (3) were appropriate for school but also supportive of work that might be created on their own time.

TABLE II. SUMMARY AND RATIONALE FOR 12 SELECTED REACTIONS

Selected Reactions	Student-generated Category	Reaction-giver Learning Activity	Reaction-receiver Learning Activity
<i>Like, Yaaass, Cool, Love it, Good work, Awesome, ☺</i>	General encouragement	Providing support; Engaging in creative community	Developing creative identity; Engaging in creative community
<i>Great details, Creative, Favorite</i>	Specific positive remarks	Critiquing digital media	Developing creative identity
<i>Try again</i>	Suggestions for improvement	Critiquing digital media	Working through cycles of revision
<i>How did you do that?</i>	Appreciation for learning	Seeking support for learning	Sharing knowledge

## V. DISCUSSION

While the design of the reactions feature is similar to patterns found in popular social networks, the design of both the structure and content of the feature emerged by recognizing and balancing cultural, pedagogical, and usability considerations.

The cultural norms for this population of Latino students around individual expression led us towards a solution offering a low barrier to participation. In contrast to open-ended commenting, reactions allow for a relatively quick and easy way to respond to others to contribute encouragement and critique. Co-design activities revealed that positive acknowledgement of shared work is a key concern for students, and reactions serves this purpose.

In terms of pedagogy, our design is purposeful in supporting instructional goals by allowing teachers to customize the list of possible reactions. In this case, we aimed to provide options in categories identified as meaningful to students, while also selecting reactions that align with teacher goals of fostering encouragement, critique, and prompts for revision. We expect that as the learning community matures, other types of responses will be encouraged and the system will allow for the content to be changed as needed.

The reactions feature also had to reflect usability considerations. For example, to avoid clutter and cumbersome interpretation, we opted to keep the list of reactions short and limit reactions to short phrases. Offering too many options would not likely yield meaningful numbers in a small community such as this one.

## VI. CONCLUSION

With the goal of encouraging communication and critique among a “reserved” population of Latino youth, we developed the reactions feature which is both familiar and fun for students, and can also flexibly align with learning goals set by the teacher. Our methods allowed us to develop a solution that responds to the particular needs of this unique Latino population. We have identified cultural, pedagogical, and usability considerations for designing user interfaces meant to encourage communication and critique around student work. We posit that this set of considerations calls attention to the

ways in which the design of online social learning networks can address equity of participation and engage diverse youth populations to contribute.

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