

**Building Self-Efficacy in Middle School Girls through  
Networked Learning of Exercise**

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## **Introduction: *Background and Topics***

### Context and Collaborators

The goal of my project is to propose a design for website, currently named The Avenue, aimed to build self-efficacy in middle school girls through the teaching and learning of exercise. I carried this project through two courses, both T526, Stone Wiske's Power of Networked Learning, and T522, David Dockterman's Innovation By Design, a course on software development. In this course, I utilized the frameworks studied in our readings and class sessions to design and develop the educational goals and activities of the site, while in T522, I focused on the visual and physical design of the website.

In T522, I collaborated in a team with classmates Diana Mazzuca and Briana Pressey. In T526, my main collaborators were Billy Corbett and James Kim, with whom I initially worked as part of a team to evaluate discussion boards from a class in Boston Latin School. While the three of us eventually diverged in our interests and projects, we continued to communicate all through the semester, sharing ideas and feedback in person and over email. I also received feedback from other classmates in T526, including David Chen, Anitha Pai, Allison Browne, and the members of Discussion Group 2, especially Anna Ho and Pradeep Gopalakrishnan. I am also very much indebted to the T526 core, and especially to Sarah, with whom I was able to have several conversations that helped me to focus my project's goals and progression. Throughout the project, I also had the opportunity to work directly with some members of my target audience. I and my two teammates from T522 all have connections to several middle school girls in Philadelphia, Boston, and New Jersey. These girls were both the source of inspiration for many of the

design elements of our site, as well as vital sources of information as we issued them our surveys, interviews, and requests for feedback on the design and usability of our site.

### Goals and Evolution of Project

At the beginning of this course, I carried heavy skepticism about the effectiveness of online networks in learning, especially that in an informal setting. I doubted whether an informal online environment could be specifically designed to foster teaching and learning, and thus made it a personal goal to better understand and learn to harness the power of networked learning through the semester. The goals of the project itself changed several times over the past few months. I started off with what I thought was a clearly defined question and problem to tackle: that physical education in middle schools was not necessarily translating to either increased in participation in or value of physical activity in the students', especially female students', lives (CITE). The original goal of my project was thus to simply promote more physical activity in students' lives.

As the project progressed, I began to realize that the problem I initially identified was not quite the root of what I was hoping to address. After several informal surveys and interviews with my target audience, I and my teammates began to formulate a new goal. The new problem area was now just focused on middle school girls. Many of the girls we spoke with not only placed little value physical activity in their own lives, but also did felt unconfident in their abilities to exercise. While I still wanted the girls to learn the importance of physical activity and to place more value upon it in their own lives, this was no longer my primary aim. Rather, my main goal became this: I wanted the girls, who often felt unconfident in their physical abilities, to learn that they were able

to overcome their own feelings of ineptitude, and through invested time and energy, reach goals that they may not have thought possible for themselves before. In other words, my goal was to help build these middle school girls' self-efficacy, and I wished to do so through the teaching and learning of physical exercise in a networked environment.

## **Self-Efficacy and Analytic Concepts: *Frameworks and Site Design***

### Summary of Site Design

My project is the proposal of the design of a website, currently titled The Avenue, for middle school girls. The Avenue is designed to look like an urban street with various locations that users can visit. These places include a Salon, Café, Gym, Park, and Dance and Yoga Studio. Users also have constant access to their Journal while in any location. The visual design of the site is not yet complete, but some current wireframes may be found in the Appendix.

The Gym, Park, and Dance and Yoga Studio each focus on teaching different types of physical exercise. Exercises include a textual description and written, visual, auditory, or video tutorials for the specific steps involved. The Cafe is the center for the social networking component of the site, where users can connect and engage with one another in discussions and team- or buddy-based relationships. The Journal serves to keep track of all the activities that each user undertakes, showing graphs and other visual displays of the types of exercises that the user has viewed, discussions that she's participated in, goals that she's set, and progress that she's completed toward each goal. The Journal also contains all the tips, videos, links, and other information that the girls

save, or add to their “Favorites”. Finally, the Salon is a space for users to learn about hair and body care, which is one of the topics that many of our end users expressed interest in learning about. Later in the paper, I will discuss the frameworks I used in designing the elements of the site, as well as more details of the major features of the site.

### Throughlines and Target of Difficulty

The Teaching for Understanding (Wiske, 2005) and Understanding By Design (Wiggins & McTigh, 2005) frameworks became anchors for me throughout the development of my project. Admittedly, I began my project with much more excitement about the features that I could potentially place on my website than careful thinking through pedagogical theories and frameworks of teaching, learning, and building a community of inquiry. I found myself jumping haphazardly from feature to feature without quite knowing why I wanted them, and soon realized that I was just being drawn by the sheer novelty of technology. Thankfully, through discussions with my classmates and deeper analyses of our course readings and topics, I recognized that without a clear delineation of my exact goals and purposes for my learners, I would not be able to successfully continue my project. Then, with help and encouragement from Billy and Sarah, I began to formulate a throughline and guiding question for my project: *If the students who used this site were to come back five years later, what I would want them to have learned and carried away from their experience on the site?* My hope is that they would have learned they are capable of learning and engaging in physical exercises that they might have previously thought too difficult, but more generally, that they would be able to pull this into other areas of their lives, and learn they are capable of facing

challenges and devising realistic steps to overcome it. Later in this paper, I will discuss more detailed educational objectives and goals, as well as the performances of understanding and ongoing assessments planned.

I also drew heavily on Wiggins' and McTighe's Understanding by Design framework to help structure my thinking about the project. I defined my desired results as *self-efficacy in learning and engaging in physical exercises*, and *greater value placed on exercise in users' lives*, one more centered on physical change, and the other more centered on mental change. Throughout the development my project, I returned to this set of desired results multiple times, tweaking it bit by bit as I learned more about my users and as I tried to sharpen my educational objectives. Defining and ultimately assessing what qualifies as acceptable evidence remained a challenge all through the semester. Because the website is designed to be an informal, opt-in environment, users would neither be obligated to participate nor explicitly tested and graded for what they learn. I started by defining evidence of increased self-efficacy as an increased amount of physical exercise in the users' lives, and evidence of placing value of exercise as increased sharing about exercise with others. I returned to these definitions several times as I wrestled with how to appropriately assess my users' learning and understanding. Finally, I categorized learning experiences into two major types: those that support the learning of specific exercises, and those that support the changing of attitudes about exercise. I further divided these learning activities into those which focused more on facilitating individual reflection, and those that also served to build a Community of Inquiry, as described by Garrison and Anderson (2011). In a later portion of this paper, I will detail how those specific activities were incorporated into the site design.

Based on the surveys and interviews that my teammates and I conducted with our end users, I defined several elements in my target of difficulty. We found that it was difficult for the middle school girls to engage themselves in learning exercises when they feel self-conscious in front of others. It was also difficult for them to know what to do or how to approach exercising on their own, as most of the girls felt unfamiliar with exercising. Finally, it was difficult for them to assess whether they were doing exercises properly once they began. All of these factors contributed to the girls not participating much in exercise either in or out of school, even though some affirmed it was important and relevant to their lives. How then can technology, specifically networked learning, address and mediate these difficulties? Networked learning can provide a “safety buffer” for girls who are not confident of their abilities by allowing them to learn more at their own pace. Networked learning can also be designed to foster the development of a community of inquiry, which can, as Lipman (1991) quoted in Garrison argues, facilitate “higher-order learning ‘that is conceptually rich, coherently organized, and persistently exploratory’” (2011, p.19). Such high-order learning, combined with reflection and discussion with others, is necessary to bring about changes in understanding and in attitude (Sorensen, 2004).

### Inspirations

I initially drew inspiration for my site design from several websites which I believed either successfully incorporated networked community, or had a heavy focus on helping users achieve goals. The networked communities that I focused on were from [www.Ravelry.com](http://www.Ravelry.com), a site for knitters and crocheters, and [www.Scratch.com](http://www.Scratch.com), a site

dedicated to the creation and sharing of Scratch projects with a heavy percentage of middle school-aged users. Sites which focused on helping users accomplish personal goals were [www.StickK.com](http://www.StickK.com) and [www.DailyFeats.com](http://www.DailyFeats.com). From each of these sites, I drew elements that I believed were key to the success of each relative site, and core to the accomplishment of their unique goals. I also sought to tie in frameworks from our course readings and discussions to these sites as grounded examples of theory in action, and used these connections to guide my design of my own site.

### Building a Community of Inquiry

Ravelry and Scratch both draw their users from individuals with similar interests. Ravelry is composed of knitters and crocheters who share projects, tutorials, questions, tips with one another, and Scratch finds many of its users in the younger population, and all are joined by their united interest in creating, sharing, and viewing Scratch projects. While these sites' users voluntarily joined together based on their shared passions and interests, my target audience is not the same. There is no shared passion of a certain sport or other physical activity, or an explicitly held common goal. The users my teammates and I had established relations with were also of many different social, economic, and cultural backgrounds, and held different levels of motivation, knowledge, and confidence toward exercise. While the vast majority of our users did not engage in or strongly value exercise, a small handful did. A question that I struggled through for much of the project was how I could draw middle school girls who have various aversions to exercise to a site which focuses on exercise. Once I do that, how could I then foster the development of a Community of Inquiry centered on exercise?

In thinking through these questions, I rooted myself in applying Garrison's Community of Inquiry framework, as composed of Social Presence, Cognitive Presence, and Teaching Presence (2011). I also drew extensively from Benbunan-Fich, Hiltz, and Harasim's Online Interaction Learning Model (2005), Swan and Shea's writings on the development of virtual learning communities (2005), Salmon's model for online teaching and learning (2003), and especially from Lock's writings on the development of communities in online courses (2007).

### Social Presence

Jennifer Lock defines community as a process that must be developed through careful and intentional planning. In likening it to the process of building a construction project, she argues that "the foundation [for the creation of online learning communities] needs firm footings and structures in place to allow for future scaffolding and the building of a community" (2007, p. 141). Lock then defines the four cornerstones of a learning community as communication, collaboration, interaction, and participation (2007, p. 133), emphasizing that the development and importance of community must be made explicit from the start (p. 139). Lock, Swan and Shea, and Salmon all maintain that a successful learning community must encourage a sense of belonging, togetherness, and trust (Lock, 2007; Swan & Shea, 2005; Salmon, 2003). Indeed, Swan and Shea go further to maintain that students who report greater experiences of social presence also report that they learn more in their courses (2005, p. 248). Ultimately, social presence is dependent on the development and maintenance of relationships between users. Lock writes that a community, as defined by Cothrel and Williams (1999) is "a group of people

who are willing and able to help each other.” (2005, p. 131). Brown (2001), as quoted in Lock, also identified three stages of community development: online acquaintance, community conferment, and camaraderie (2005, p. 140). I thus sought to design a foundation by which these three levels of community development could later be developed.

Users on The Avenue each have a personal profile, where they may input their personal interests, exercise interests, favorite activities, music, places, and other information they choose to share about themselves. The Cafe is the central social network on the site, and users may search for and connect with other users based on their exercise interests and goals (as defined in their profiles), or invite personal friends to be their “exercise buddies”. Users may join Teams, which are formed based on similar exercise interests, such as dance, running, walking, or soccer. Users can write public messages on both their exercise buddies’ and Teams’ “walls”, issuing challenges to one another, or asking questions, posting comments, or sending encouragements. Additionally, users can write public blog entries viewable by their exercise buddies to reflect on their feelings about exercise and what they are learning, and share their favorite exercise tutorials with their buddies and teammates. Users may also “cheer” for their exercise buddies or Teams. This “cheer” functionality is similar to the “like” function on Facebook, which provides a low-threshold means of interacting with other users on the site. These means of interaction are all designed with the goal of developing social presence in the site.

### Cognitive Presence

Garrison's Practical Inquiry model (2011) helped me to structure the design of the foundations of cognitive presence on The Avenue. I also drew upon Bonk and Zhang's Read, Reflect, Display, Do learning model (2008), as well as Schneiderman's Collect, Relate, Create, Donate framework (Reich & Daccord, 2009).

The first step on the Practical Inquiry cycle is the triggering event. The users that my teammates and I interviewed stated that they were most interested in learning dances and learning about how to avoid sweating. The Avenue was designed to encourage exploration based on each user's personal interests. New users are directed immediately to their profile page, where they are encouraged to input their personal interests and exercise interests (what activities they either like or would be interested in learning). From here, the site provides some recommendations of places that the user can visit, and activities they might like to try. If the user does not input anything, the site will always provide a summary of available activities for the user to explore, and provides hover-up descriptions and tips about what the user can do. All of these are designed in hopes of triggering something related to the user's interests, whether that is an activity, a type of music, or a topic of interest. These recommendations are drawn from a database of what surveyed users have stated as their personal interests, and will grow adaptively as more users join the site.

The next step in the Practical Inquiry cycle is Exploration. The Avenue is designed as a graphics-heavy, exploration-based site. There are no typical menus or navigation bars, although users may save favorite locations to their Journal and access them easily at any time. In the Gym, Park, and Dance and Yoga Studio, each exercise

tutorial displays its corresponding interactive discussion board, related exercises and discussion boards, and a “What Now” section that provides tips, user- and expert-generated suggestions on next steps, and the option to save any exercises or tips to the user’s Journal. These all are designed to encourage the user to explore the site at her own pace, and provides a method for her to return to objects or places of interest more easily later on through her Journal. Within this exploration step, I drew upon Bonk and Zhang’s Read, Reflect, Display, and Do models of learning to incorporate different potential user preferences. Users may read articles about tips, exercises, and topics of interest, or may choose to reflect through the private diary entry function of the Journal. Users might choose to view video tutorials about exercise rather than reading written descriptions, and users are all encouraged to try out any exercises themselves, and keep track of what activities they’ve done. This is also where users may collect information about exercise, tutorials, tips, and other knowledge from discussion forums or other users’ pages. Every page provides a few links to related topics, and users may either choose to explore the site through those or through a direct search to find topics that interest them.

The next step is Integration. During this step, users may begin to relate the topics they’ve seen in discussion forums or Team or user pages to their own lives. Users may view other user’s profiles, which display their interests, Teams, and any shared blog entries and favorite tutorials and tips. A user might find that she has much in common with others who like certain activities, or in discussion boards, might see a topic about relieving soreness that she can relate to. Upon completion of any exercise tutorial (users are asked to mark that they’ve completed it), the user’s Journal gently prompts her for brief input about her thoughts about the tutorial, what she did alongside watching or

reading the tutorial, and gives her the option of writing a longer diary entry about it. Users may choose to write diary entries at any time, and each new diary entry may be either completely blank to start, or issues an optional prompt for the girls to think and write about if she so asks. These diary entries are one of the ways that we hope to encourage and facilitate personal reflection. Another means of reflecting is through users' interaction with other users, either in a discussion board, on a user's wall, in the comments of public blog entries, or in a Team wall. As Sorensen writes, "there is no level of (inter)action without a process of reflection." (Sorensen 2004, p. 252).

The final step in the Practical Inquiry cycle is Resolution. When first registering for the site, users are also asked whether they would like to make a personal goal now or later. This goal is inspired by StickK's goal-achievement program. If users on The Avenue choose to input a goal later, they are periodically asked whether or not they would like to consider adding a personal exercise goal through their Journal. Once an exercise goal is made, the user is guided along a scaffolded process to decide the ways that she would like to keep track of her progress along that goal. She can read questions and suggestions issued by the Journal, or visit discussion pages about helpful ways to make and work toward goals. Users can also track their progress in different ways, either through directly inputting data into the Journal through the website, or by setting up an email-notification or text-message-notification system to keep track of their personal activity. Once users have set a goal, it is published to their profile, and they can also connect with users who have similar goals. Each goal is tagged automatically based on keywords, and can be retagged by the user to relate to specific categories such as swimming, flexibility, or others, and users may then choose to either automatically join

or opt out of a Team made of people with similar goals. Teams boards are meant to facilitate discussions, the sharing of encouragement, tips, and general conversations within a more specific context. Both StickK and DailyFeats's allow their users to recruit the support of family and friends through email invitations. An activity that a user may choose to partake in the Resolution stage may thus be to invite her friends or family to the site as well. Finally, users have the capability to write their own wiki's, exercise tutorials, and tips, post anytime on discussion forums, write status updates, and publish any of their personal diary entries if they so choose.

### Teaching Presence

As my project is set in an informal environment, there is no official teacher or student role. However, our course readings from Garrison (2011), Benbunan-Fich et. al. (2005), Swan and Shea (2005), and Salmon (2003), and our course discussions and my experience as discussion moderator have all reiterated the importance of having structure and guidance in some way, even in informal settings. As Moller, quoted in Lock affirmed, the "use of technology does not spontaneously cause communities to occur; communities of learners must be planned." (Lock 2007, p. 138). While my teammates and I would serve as official moderators on the site at least to start, we also hope that, as in Enomoto and Tabata's work as quoted in Lock, that our site would transform "into a 'student directed, peer learning experience'" (Lock, 2007, p. 135). As the initial moderators, we will seed some exercise tutorials, wiki's, discussion topics, and will actively participate in the social network. Also, we will hold to timely and frequent replies to user questions and posts on the forums, lay down clear guidelines on the

expectations we have of user-interactions, and work to “celebrate, give value to and acknowledge” user participation (Salmon, 2003, p. 40). For the raising of peer-leaders, I looked especially to the Scratch community and their model of peer-moderators. Peer-moderators are individually invited to be on-board by members of the Scratch staff, and are often users who have exhibited high levels of positive participation on the site. These are what informed me in the design of The Avenue, where each user’s will have a public record of their activities on discussion boards, other user pages, Team pages, and publicized writings through either blog entries or contributions of tips, tutorials, and wiki’s. The hope is that this might encourage users to participate actively, as higher rates of participation can earn users different statuses that indicate their amount of presence on the site. We also hope then to extend the invitation of being peer-moderators and peer-leaders to certain users, just as Scratch has for their most active users.

### Performances of Understanding

My originally defined evidence of increased self-efficacy and increased value of exercise was an increased amount of physical exercise in the users’ lives, and increased sharing about exercise with others. In the site itself, most of a user’s understanding of exercise is voluntarily self-reported through diary entries and blog entries. Users also track their own exercise activity outside of what they do as part of learning tutorials on the site. Because these data are self-generated, I am hesitant to say that they are the best means of measuring performances of understanding. However, a user’s activities on the site are all automatically tracked. Thus, we can more easily measure whether or not a user is sharing about exercise with others based on how many friends the user invites to join

the site, how many posts on average she makes on others' walls and forums, and how many public contributions she has made in the form of blogs, wiki's, tips, and tutorials. A continuing puzzle however, is whether or not these measures really do assess self efficacy. Are these acceptable forms of evidence truly necessary and sufficient?

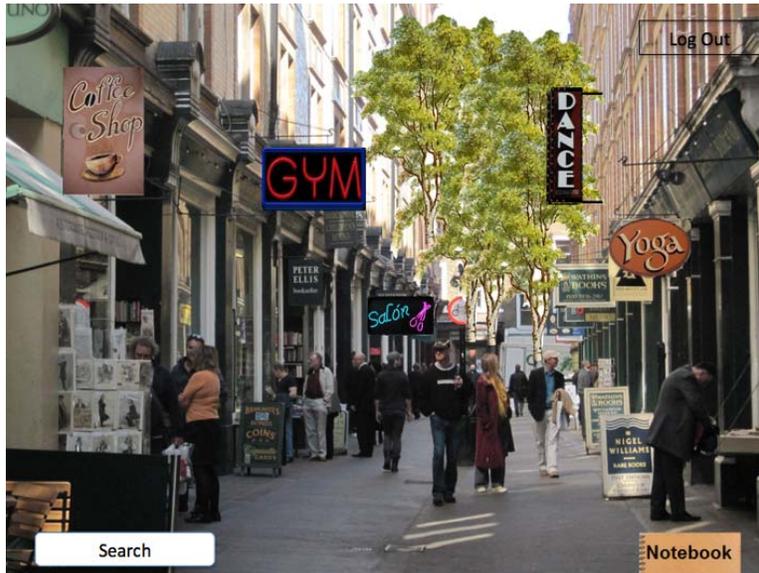
### **Conclusions: *Looking Ahead***

While the core design of The Avenue is now complete, I still wrestle with the fact that the site has yet to be truly tested. While I have gotten feedback from my end users on the design of the site during different stages of its progression, I have yet to bring the site to life in full functionality. I and my teammates from T522 may choose to continue this project in a course during the Spring semester, and if so, we hope to put an actual working iteration of the site to the test.

## Appendix

### Recent Mock-ups of The Avenue:

#### Homepage - Street View (Main View)



#### Social Network - Cafe



### Reflection – Journal



### Hair and Hygiene Advice – Salon



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