First Steps: Cultivating an Online Community of Practice for Parents of Youth with Autism Spectrum Disorder

A Pilot Study

Krista Galyen

University of Missouri-Columbia

May 7, 2010

I. INTRODUCTION

Communities of practice (CoPs) are known to have potential benefits in facilitating knowledge sharing and decreasing isolation among its users (Dunham et al., 1998; McInnerney & Roberts, 2004; Rodgers & Chen, 2005). This is often due to a flurry of activity present from a vibrant community (Herring, 2001). However, a requirement of a vibrant community, or even developing community, is that its members participate within the online environment. We are still learning how to cultivate participation in these online communities of practice (Wenger, McDermott & Snyder, 2002), especially those that begin with a small membership base (Preece & Maloney-Krichmar, 2003). While membership number (also known as "Critical Mass") is influential, it is by far not the only aspect that informs the design and cultivation of these types of communities.

Understanding how to cultivate small-membership online CoPs may lessen the frequency of their failure. In this paper, I present a qualitative research study that investigated the first steps of a design-based research project. This study investigated the process of cultivating a small-membership online community of practice for parents of youth with ASD. Understanding the underlying processes of the interactions and needs of this small-membership group will help to further the design-based research process as well as help to inform the literature regarding small-membership cultivation of CoPs in general.

II. LITERATURE REVIEW

What are Communities of Practice (CoPs)?

Communities of Practice are defined as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly," (Wenger, 2006). For example, a large online community site for parents of children with cochlear implants has members which come together regularly by logging in, reading, posting, sharing their experiences and asking questions, and sharing knowledge with each other. There are leaders who are central and are highly visible and active, and there are those who legitimately participate on the periphery (or "watch") the exchanges. This occurs regularly around the domain of learning about cochlear implants.

However, not just any group that interacts can be labeled a community of practice. According to Wenger et al. (2002), there are three basic components that must be present in order for the group interaction to be classified as a community of practice. First, the community interaction must be centered on a ***domain***. In other words, the group interaction must be "about" something. In the case of our study, the domain would be parenting adolescents with autism spectrum disorder (ASD). Second, the group must have a ***community***; there must be interaction and presence among the members. Finally, the group must have a ***practice***; knowledge about the domain, the ability to share cases on which knowledge builds, and shared repertoire. By having all three, the interacting group becomes a community of practice (see figure 1.1).

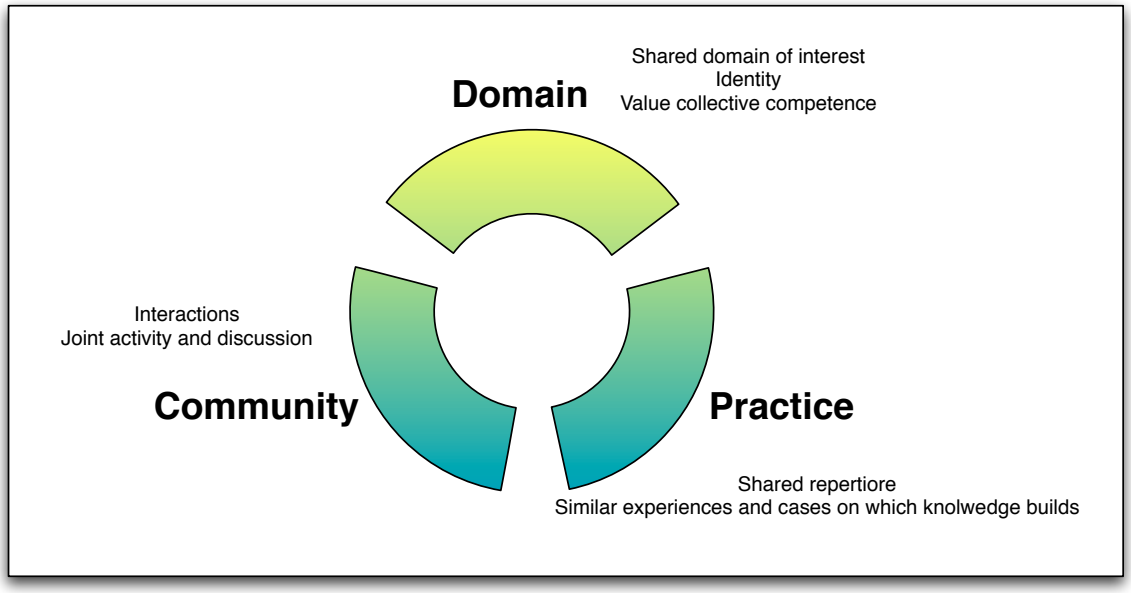

Figure 1.1. The three components to a community of practice: domain, community, and practice.

Cultivating a community of practice focuses on cultivating all three areas simultaneously. In other words, helping the members share their cases and experiences within the common domain, and through this regular interaction, knowledge and community grows among members.

General Online CoPs

Several studies inform our study regarding cultivating online CoPs.

While there is much research on sustaining involvement in an online CoP, there is little research on the motivation and barriers of involvement in the first place (i.e., logging in, reading). Hew and Hara (2007) studied the motivations and barriers of teachers' online knowledge sharing in a qualitative study using semi-structured interviews. "Collectivism" and "principlism" (also known as *reciprocity*) were

motivating factors for online knowledge sharing whereas "lack of knowledge" and "competing priority" were barriers to online knowledge sharing. However, Hew and Hara's focus was strictly on knowledge sharing, and did not delve into other aspects that may facilitate a more broad definition of involvement such as a user logging in, exploring the site, and/or reading what another participant has posted.

Ardichvili, Page, and Wentling (2003) performed a qualitative study of motivations and barriers to participation in online knowledge-sharing communities among business employees. They also found that reciprocity and collectivism were motivators, and fears of lack of knowledge or trust were barriers in knowledge contributions. While these findings contribute to our knowledge of why people actively share information with one another in a community and what inhibits visible participation (such as posting a question or experience), we are still left with the question regarding the barriers for an even more broadly-defined definition of participation, such as logging in and reading. We need to understand the motivations and barriers for people *getting into and looking around* the online community before we can understand how we can enhance their contribution rate.

Online CoPs with Parents of Youth with ASD

Parents of children with autism spectrum disorder (ASD) face challenges as their child grows and develops. The challenges often cause familial stress which influences the parents' ability to help the child and follow through with appropriate recommended interventions (Baker-Ericzen, Stahmer & Burns, 2007; Bouma & Schweitzer, 2006; Hastings & Johnson, 2001; Noh, Dumas, Wolf & Fisman, 1989). However, parent

education and group-based interventions have been shown effective in lessening this parental and familial stress. Some of the key stress factors found in Cassidy, McConey, Truesdale-Kennedy and Slevin's (2008) study of over 100 parents of children with ASD were social isolation, continual stress, worries about the future and finances, and embarrassment.

While stress is a large problem of parents of students with ASD, online communities have shown to have a beneficial effect for people in general experiencing stressors and isolation (Rodgers & Chen, 2005). Dunham, Hurshan, Litwin, Gusella, Ellsworth, & Dodd (1998) have noted that families of children with disabilities who are isolated (due to geography, time, or resource constraints) can use an internet community to lessen their isolation.

Summary

In summary, there are two broad issues that need to be explored together: 1) the motivations and barriers for participation of parents of children with ASD, and 2) how to design and develop an online community that will cultivate basic levels of participation such as logging in, reading, and sharing among this group. It is understood that parents of children with ASD experience stress and isolation, and parent groups, in particular internet groups, have affordances which can assist this. Online communities, can help. However, there is a gap in the research for understanding the basic motivations and needs of this parent subgroup to get online and interact with each other, as well as design principles that would target those motivations and needs.

Because of this, our research questions are the following:

What aspects of the site and design served to cultivate a CoP among these parents?

What aspects of the site and design detracted from the cultivation of a CoP among these parents?

How might the findings inform the future community design and cultivation of our own Parent Community?

How can we inform the design processes for this type of CoP based on the data?

III. METHODS

This pilot study was the first step in a design-based qualitative research study on cultivating an online community of practice for parents of youth with ASD. The activity took place through the "Parent Community" online site, created specifically for online access to the parent ASD curriculum and parent-to-parent discourse; this will be described in more detail in the following section. The study took place over a 6-week period.

Design-based research served as a methodological guide for this study by providing the following principles: 1) implementation of a design within a naturalistic context, 2) iterate over several periods in order to understand the complexities of the design as implemented in context, and 3) contribute to the creation of model(s) and/or theory in regards to the design process and principles for such a context (Barab & Squire, 2004; Collective, 2003; Reeves, Herrington & Oliver, 2005). For our study, the *Parent Community* website and guiding strategies were implemented in a natural context with this study representing the first iteration.

The Online Parent Community Website

The *Parent Community* website was designed and developed prior to the start of this study. There are two main sections in the *Parent Community*: "Learn" and "Discuss," (see figure 3.1). The "Learn" section contained the parent version of the social-cognitive curriculum that the adolescents received. The content was "locked" in the sense that a parent needed to finish one part in order to "unlock" and have access to the next part of the curriculum. The locking aspect can be seen in figure 3.2 in which the user completed the first unit, has access to the second unit, and is locked out of the remaining units (due to not having completed the second unit yet).

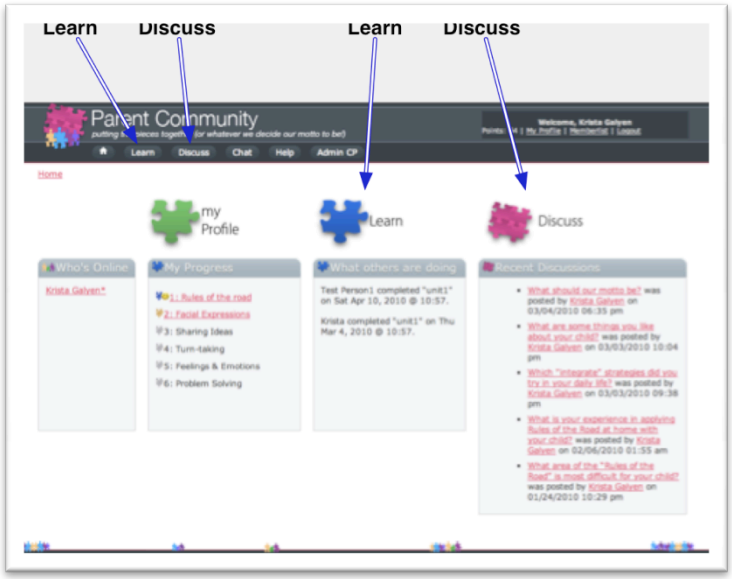

Figure 3.1. "Learn" and "Discuss" are two main sections of the online community

In addition, each unit is composed of the following:

1. **Survey 1** (5 questions assessing their general knowledge of the content in that unit along with dynamic feedback regarding what they know, what they need to learn more about regarding that content; see Figure 3.3)

2. **Discuss** (A prompt for discussing what they just learned about the basic elements of that unit from the survey and feedback)
3. **Survey 2** (Allows further attempts for assessing what they know and receiving feedback)
4. **Apply** (Apply one main technique at home with their child regarding the unit; see figure 3.4)
5. **Integrate** (Lists many strategies that they can try at home; see figure 3.5)
6. **Maintain** (Downloadable tip sheets for each unit)

At each level within the unit, they are prompted with a link to discuss their thoughts and experiences. The discussion board (see figure 3.6) is not locked, and is free to access at any point in time for members.

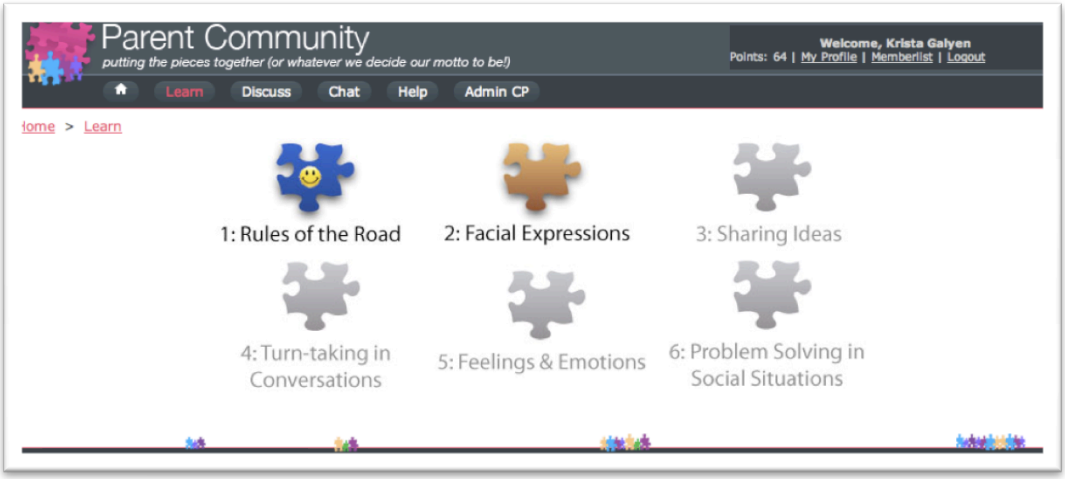

Figure 3.2. For this user, the first unit is completed, the second unit is not complete but is accessible, and the remaining 4 units are locked and inaccessible

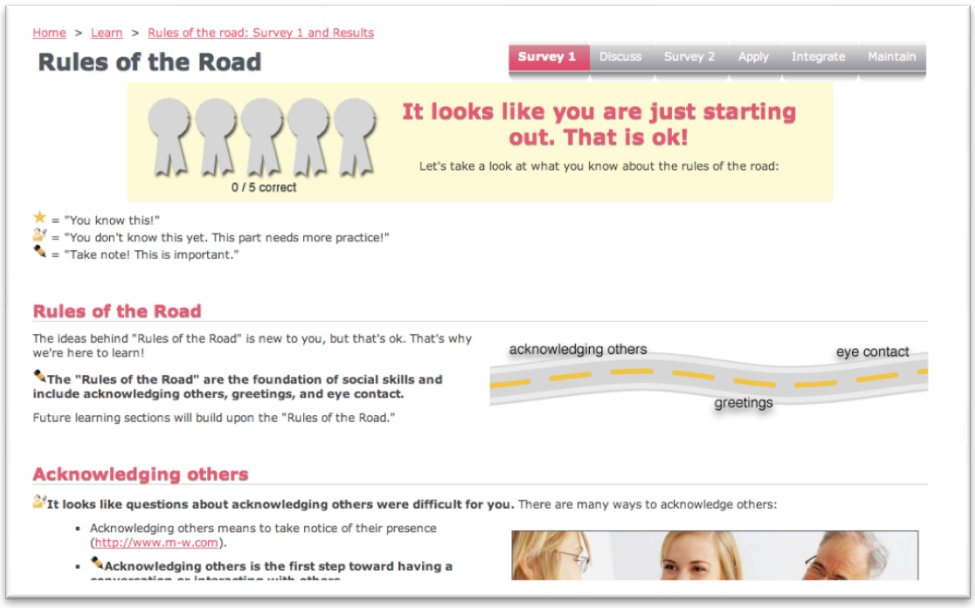

Figure 3.3. The survey above shows 0 out of 5 correct answers from the survey and provides feedback regarding the first unit information

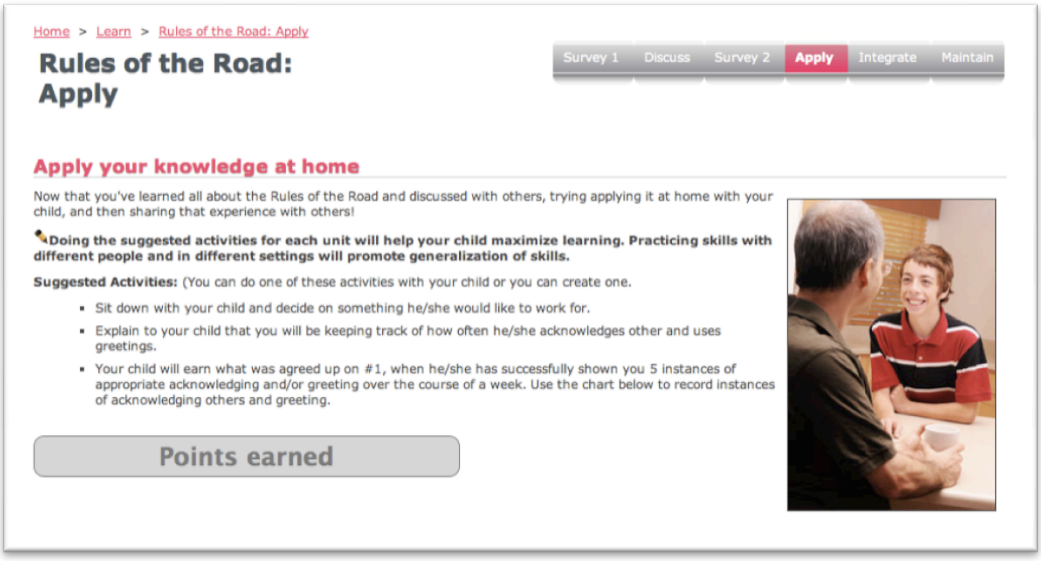

Figure 3.4. The apply section provides a few focused activities to try at home with their child

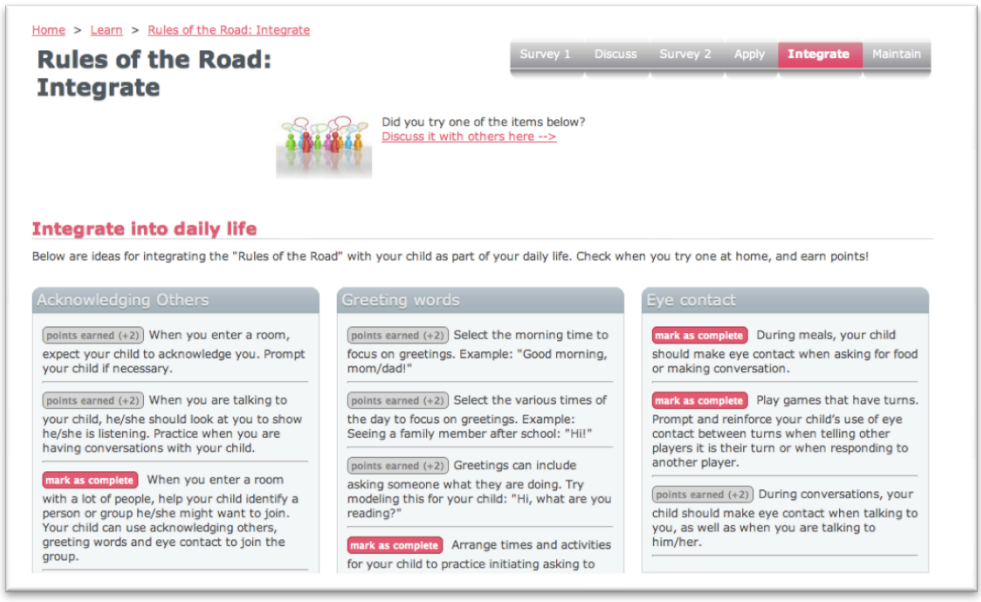

Figure 3.5. Integrate provides a more extensive list of strategies for parents to try at home

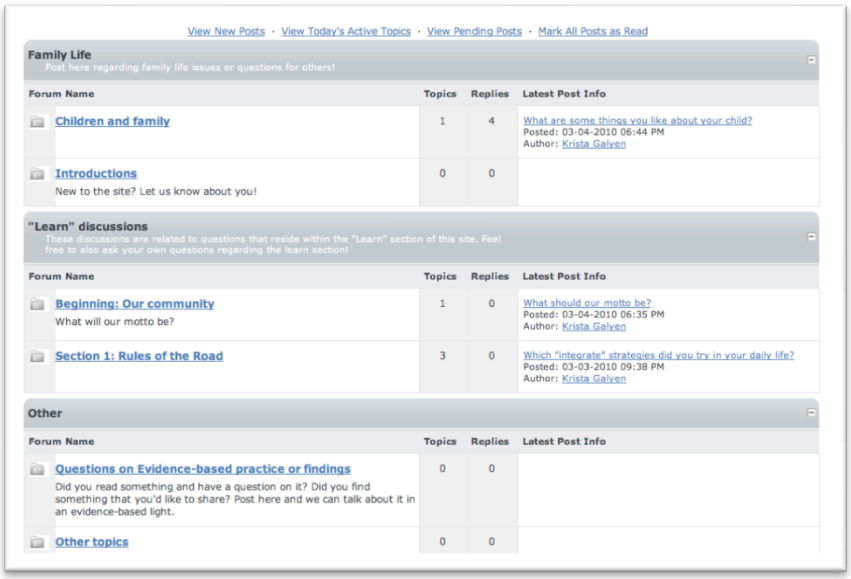

Figure 3.6. The "Discuss" section is a discussion board embedded within the community site. Unit activities link to the threads within the discuss section.

Research Context

This study took place in a medium-sized Midwestern community that contained a center for autism and ran a social-cognitive intervention program for adolescent youths with ASD. The intervention program was implemented in several middle schools throughout the community, one of which permission was granted to serve as the research context.

Sample and Access to participants

A total of 10 parents had children who were attending the ASD intervention program specified above at the particular middle school. All parents were contacted via email and/or phone regarding willingness to participate. Five parents total volunteered for the study, two pairs (four total) of which are husband and wife. This group was chosen due to accessibility, prior involvement with the intervention program, willingness to volunteer, and school district permission restrictions. Table 3.1 provides demographic and background data on the participating parents:

Table 3.1: Sample demographics

Parent Code	Sex	Age	Child	Siblings and Home Life	Computer usage at home
P1	Male	40s-50s	Son	Three other siblings. Mother works out of state for 5 out of every 6 weeks.	Moderate computer usage (maximum of a few hours every day)
P2 & P3	P2: Female P3: Male	40s-50s	Son	One other sibling. Parents involved.	Little computer usage; discouraged for use > 1 hour a day
P4 & P5	P4: Female P5: Male	40s-50s	Son	One other sibling; parents involved.	Lots of computer and internet usage (many hours a day)

While maximum variation stratified purposeful sampling was planned for choosing whom to interview, due to the low number of volunteer participants all participants were interviewed.

Informed consent letters were approved and given to the five selected parents during a face-to-face introductory meeting held at the middle school. There was very little risk to the participants in that they could participate as much or as little as they saw fit and could withdraw at any time.

At the start of the study, parents were gathered face-to-face for a 30-minute introduction to the site and the study. After an overview of the site, all parents were given instructions to follow the following schedule over a one-month period:

- **Week 1:** Start unit 1 "Rules of the Road"
- **Week 2:** Continue "Rules of the Road", participate in discussions
- **Week 3:** Start unit 2 "Facial Expressions"
- **Week 4:** Continue "Facial Expressions", participate in discussions

Data Collection

Data sources consisted mainly of interviews, observations, and artifacts such as environmental data from the *Parent Community* site (such as reads, posts, and data log).

Observations

Observations took place during the initial face-to-face introductory session that took place at week 1; it lasted approximately 30 minutes. Parents were given the suggested schedule of activity and walked through the site. Each parent had access to a

computer and was given the login information at that time. Observational notes were taken and later coded (as described in the coding section below).

Interviews

Interviews were conducted at two time periods: week 2 and week 6. The interviews lasted approximately 30-60 minutes apiece and were recorded and transcribed; if a couple was married, the interviews lasted slightly longer than those who were interviewed alone. Table 3.2 displays which interviews were able to be completed. Only P2 and P3 completed both week 2 and week 6 interviews; P4 and P5 were not able to be contacted for the first interview, but consented for the second. P1 had family issues and was not able to complete the second interview.

Table 3.2. Parent Interviews

	P1	**P2 & P3 (married)**	**P4 & P5 (married**
Week 2	X	X	(no interview)
Week 6	(no interview)	X	X

The interviews were semi-structured. Interview 1 had questions focusing on needs ("What are some experiences you've had with your child that you felt you needed help with?"), motivation for participation ("Tell me why you wanted to be a part of this community."), use of the site and interactions with others, perceived usefulness of the site, projected use of the site and its strategies to their daily life, and background questions. Interview 2 again asked questions focused on needs, use of the site and interactions with others, perceived usefulness of the site and its interactions with others, and projected use. However, there was an additional activity in which the participants were walked through the site for the entire unit 1. They were asked questions regarding its usability, usefulness, applicability and thoughts on additional changes or suggestions.

Artifacts

Usage data and posting content from the *Parent Community* site were collected. All parents were shown to have logged in during the face-to-face introductory meeting, but none logged in afterwards. Due to this, initial interview questions were altered to reflect a more needs-based approach as to how and why they might be interested in participating in the site rather than how the site was transformative. In addition, due to the lack of site use the interviews became the primary data source.

A research progress journal and memos were kept. The researcher's journal documented my own feelings and thoughts throughout the process. Memos served to document the progress of the research, potential codes, and directions for research.

Data Analysis

An inductive approach to analyzing the data was taken, utilizing grounded theory techniques (Charmaz, 2006). Open coding was performed on the interviews and observations using a line-by-line coding technique (Charmaz, 2006); with the "thought unit" as the unit of analysis (essentially "though-by-thought" coding).

After open coding was completed on all interviews, categories of codings began to emerge through the use of axial coding (Corbin & Strauss, 1990). After the categories were established, the categories of codes were linked to the a priori community of practice codes of "domain", "community", and "practice". This analysis technique served to provide a grounded approach to identifying how to facilitate and cultivate a community of practice for parents of youth with ASD.

RESULTS

Participation

Participation in *Parent Community* was extremely minimal to nonexistent; as such, the flurry of activity necessary in the cultivation of community never occurred. All parents had participated in the site during the face-to-face introductory session in week 1. However, following week 1, none of the parents logged in. However, the interviews revealed the following themes regarding participation: 1) lack of time and "managing the moment", 2) excitement about the site ("learn") portion, and 3) desire to connect with other parents on a social level.

Lack of time and managing the moment

During the interviews parents often stated, "there's just too little time," they have to "manage their priorities", and "there's only so much time in the day." This is evident in the following comment from P1:

> *"My thing is just time. Prioritizing what's real, what really matters. What needs to be done right now. Managing the moment."*

The idea of "managing the moment" came up frequently with the parents, especially when dealing with problems that their children would have. Because of this issue of needing to "manage the moment," many parents did not like the locking mechanisms placed in the "Learn" section. They felt it would prohibit them from using and participating in the site at crucial moments when they might need the information most.

As P3 stated,

> *"Why would you have something locked? One day he might be acting one way, the next he might be acting another way. It doesn't make any sense. Rule 1 might be for Friday and Rule 6 might be for tomorrow. Because they don't know what they're doing from day to day, what their reactions are going to be…You might be having the whole week might be emotions or sharing. You know, that might be the biggest issue that week."*

The ability to manage their time -- by accessing what they needed right then at that crucial moment -- was of great interest to them. The site, as they saw it, would not allow them to do that.

Excitement about the potential

While all of the parents mentioned that time was a major factor in getting logged on to the site, many were motivated and even excited about the site when taken through a walkthrough of the units and discussion forum. At times, parents were even surprised at what was contained in the site, demonstrating that use of the site itself may serve as a motivator in its continued use.

A desire to connect and share

In addition, the interviews revealed that parents earnestly want to connect with other parents: to share their experiences both in seeking answers and just for moral support, and to connect on a social level. One of the parents thought it would be nice to be able to interact online but then meet up face-to-face every couple of months. All the parents, who did not know each other before this study, were eager to meet the other parents that their children sometimes mentioned while at home.

These three themes under the prerequisite of participation can help to inform us about how to iterate this design for cultivating a community of practice.

Domain and Community

A desire to engage with each other about ASD

In regards to domain and community, the parents never expressed these separately; parents wanted to engage with each other and share their experiences about having a child with ASD. Often the parents weren't focused on sharing in order to solve an issue, though all parents at some point in time raised the issue. All the parents did focus on a desire to just share, to connect, and to not feel like they were the only one with these issues or questions.

At one point, P5 mentioned "Sometimes I wonder if I didn't have enough eye contact with my son when he was little. They say that parents are a child's first role model." A desire to connect with others and to share the internal questions, thoughts, and experiences in order to not feel alone was a big component of their desire to share.

P5 also expresses this sentiment well this statement:

> *"I would not just want the information that you can get out of books and people writing papers and stuff. I would like to hear similar experiences from parents and what their experiences are and what their concerns are, and see if I'm thinking that, 'Ok, I was thinking good on this like those other people there.' You know, just some support a little bit."*

For these parents, domain and community were integrally tied together in the desire to share with each other regarding their child with ASD. While finding solutions was a benefit, the connecting with others was even more important.

Practice

Under the area of "practice" (shared practices and repertoires), the parents had three common themes: 1) similar daily struggles, 2) similar worries, and 3) similar hopes for their child. These experiences and stories that they have are the potential practices which can bring this group of parents together.

Similar daily struggles

Similar daily struggles often surrounded trying to help their child with the social skills needed to successfully function in life: eye contact, keeping and maintaining friendships, and successful communication (such as not taking everything literally and understanding jokes).

For example, P2 explained how she constantly struggles to help her son engage with people who are trying to speak to him:

> *"We're constantly telling him, there's a lot of people that will talk to him when we go places, especially at church. Last night when we were leaving, people were telling him goodbye and see you Sunday and he was off in his own little world on the way out the door. You have to kind of reel him back in and tell him, 'They're talking to **you**, you know!'"*

Similar worries

But in addition to having similar daily struggles, they also have similar worries about their children, which are derived from their experiences. Many of the worries center around helping their children create and cultivate friendships and socially flourish outside of the home without supports. The worries are two fold: how do they know as

parents if they're doing the right thing at the right level for their child, and how can they ensure their child will be successful?

P5 expressed concern about how their child was going to interact in the social world without both of them around to help him:

> *"And as he gets older and older and the transition into what he's going to do when he's in college level, which way is he going to go? How's he ever going to interact when we're not here?"*

Similar hopes and dreams

But while they all had similar struggles and worries, they also showed that they had similar hopes for their child. The hopes were often closely connected with the worries and the struggles, rooted in the hopes that their child would be able to flourish socially and make friendships. The parents were often not concerned with school work or their child's ability to mentally comprehend a skill or trade in their future. It always boiled down to the hope that their child would be able to connect to others and make friendships, as expressed by P2:

> *"I want to mainly learn how to help [my son] make better friends, longer-lasting ones."*

Experience with the Parent Community site

Parents' reactions to the technology itself were positive, even though their interaction with it was limited. The positive reactions to the technology were that it was:

- Easy to use
- Straightforward

- Useful in seeing what I'm doing right in addition to helpful hints
- Easy to post

However, the negative or suggested changes to the technology were:

- Needs to unlock "learn" contents for jumping around content
- Needs more images rather than just text

All parents who did the walkthrough found the "learn" portion very helpful, although the locking mechanism concerned them if it was too stringent. They suggested perhaps having the tip sheets available for all units in case of the "emergency situation" with their child; this way they could access information and find help regarding the situation at hand.

Unexpectedly, the strategies that were listed in "apply" and "integrate" sections not only gave them ideas on what to try with their child, but also helped a few parents to realize things *they were already doing well*, as well as things their child was already doing well. This often gave the parents a sense of accomplishment and reassurance. At times, the strategies helped parents to recognize when they themselves were not employing the necessary social skills. As P4 stated:

> *"It's a lot of good ideas. I saw something we already did. I didn't realize it was something we already should be doing. I guess we should be expecting the same at home and out there…How can I expect my son to do it if I don't do it myself? When you're busy and I don't acknowledge him, how can I expect him to do it?"*

DISCUSSION

A model for cultivating online CoPs for parents of youth with ASD

Based on the results, the following model is presented. Modified from Wenger (1999), it presents the grounded categories that were presented in the previous section (see figure 4.1).

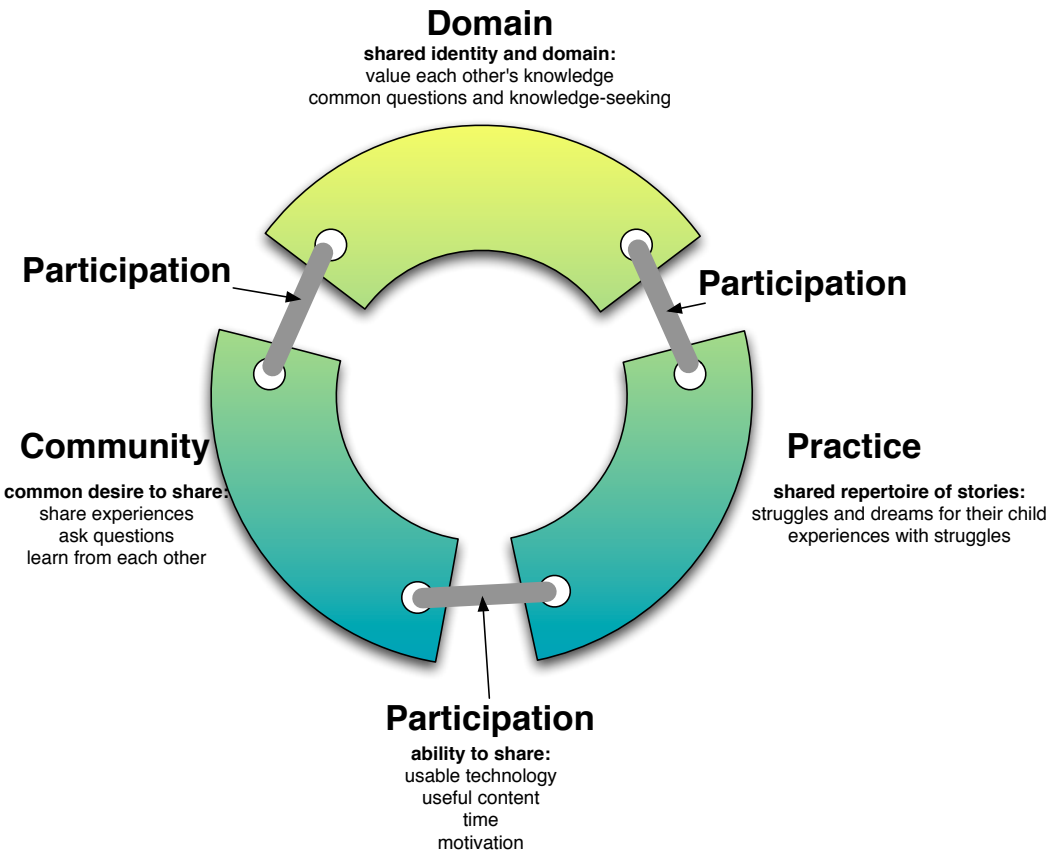

Figure 4.1. A model for cultivating an online community of practice for parents of youth with ASD.

The modification to the model was in adding in "participation" as links between the domain, community, and practice. While community emphasizes the act of sharing, participation is one step before that: logging on, looking around, and taking action. The participation is the necessarily piece that brings everything together. Without participation, the rest of the pieces do not connect. Participation includes the ability to

share: having usable technology, useful content, having the time and motivation to use the technology and interact.

The grounded categories are placed underneath the 3 main facets of a CoP. Underneath practice, the parents should be facilitated in sharing struggles and dreams as well as everyday experiences that they have with their child. Through this sharing, community and domain are automatically built, thus practice in this type of CoP, and the sharing of their experiences, is central to its cultivation.

However, there is another piece to the model that affects *how* this cultivation must be structured.

Unstructured vs. structured social systems

It is known that unstructured social systems have the "long tail effect" (Shirky, 2003). In other words, social systems without too much structure (as opposed to "You need to do A, B, and C by June 1st") tend to have a few people who do **a lot** of activities within the system, and a lot of people who do very little.

In contrast, highly structured systems (think of an online course with due dates, timelines, accountability, and grades) tends to shorten this tail and even out this curve of participation (see figure 4.2).

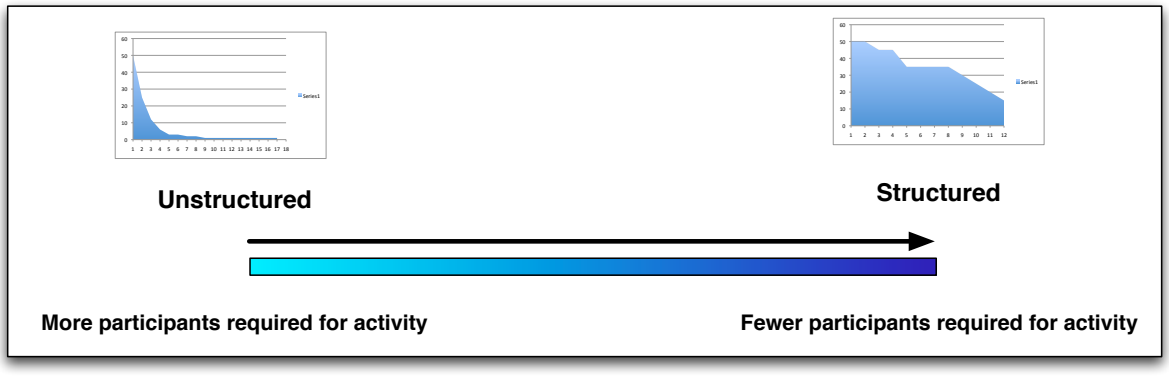

Figure 4.2. Unstructured versus structured social systems

So why does this matter here? In this study, we had only five participants. While we gave them a suggested schedule, it was relatively unstructured. In order to create a flurry of activity with only 5 individuals, a large amount of structure is required. However, suppose there are 1,000 individuals in the community. While most of the people will not be participating very much, there will still be a flurry of activity to facilitate the cultivation of the community. With 5 individuals and little structure, the long tail actually becomes a "flat tail" (a.k.a.: no participation), which is what occurred in this study.

So in addition to the model in figure 4.1, figure 4.2 must also be taken into consideration. While more structure tends to lend itself to a top-down approach and lessen the bottom-up, natural growth a community of practice needs to grow and thrive, a community such as this could start on the right edge of a structured community, and over time, as membership grows and activity increases, slowly move over towards the left, unstructured end over time.

As membership grows, this would be evaluated:

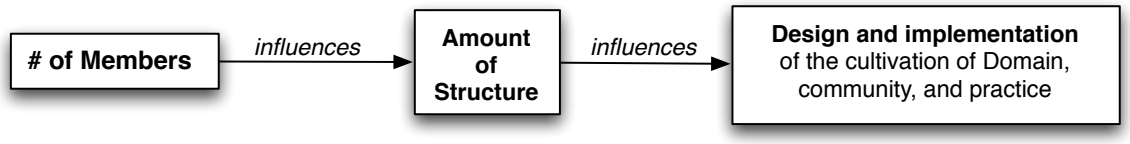

Figure 4.3. How number of members influences the design of cultivation of community

Building upon the past

Our results build upon the prior literature in that we have been able to break down the beginning stage of cultivation of an online community of practice for parents of youth

with ASD: what aspects to focus on that parents find motivating and valid in all three areas of domain, community, and practice, how technology must be useful, usable, timely, and motivating to use. More importantly, how membership number may be a large factor in understanding how to structure that cultivation in the beginning stages in order to foster participation, which leads to sharing and interaction.

LIMITATIONS

Limitations of this study are that only a limited number of selected parents from a certain demographic were available for this study. Not all participants received both interviews, and further study is warranted.

FUTURE DIRECTIONS FOR RESEARCH

Future directions for research are to take the next steps in the design-based research. This would include:

- Iterating the design prior to the next study:
    - Attempting to get more parents
    - Using the model developed to guide structure and design for motivating participation
    - Iterating the technology according to suggestions (allow more freedom to the material and add more images)
- Conducting the research with these iterations in place, modifying the design model as needed for cultivating an online community for parents of youth with ASD.

REFERENCES

Ardichvili, A., Page, V., & Wentling, T. (2003). Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *Journal of Knowledge Management*, *7*(1), 64-77.

Baker-Ericzen, M. J., Stahmer, A. C., & Burns, A. (2007). Child demographics associated with outcomes in a community-based pivotal response training program. *Journal of Positive Behavior Interventions*, *9*(1), 52.

Barab, S. & Squire, K. (2004). Design-Based research: Putting a stake in the ground. *The Journal of the Learning Sciences*, *13*(1), 1-14.

Bouma, R. & Schweitzer, R. (2006). The impact of chronic childhood illness on family stress: A comparison between autism and cystic fibrosis. *Journal of Clinical Psychology*, *46*(6), 722-730.

Cassidy, A., McConkey, R., Truesdale-Kennedy, M., & Slevin, E. (2008). Preschoolers with autism spectrum disorders: The impact on families and the supports available to them. *Early Child Development and Care*, *178*(2), 115-.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis.* Sage Publications Ltd.

Collective, T. (2003). Design-Based research: An emerging paradigm for educational inquiry. *Educational Researcher*, *32*(1), 5-8.

Corbin, J. M. & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, *13*(1), 3-21.

Dunham, P. J., Hurshman, A., Litwin, E., Gusella, J., Ellsworth, C., & Dodd, P. W. D. (1998). Computer-Mediated social support: Single young mothers as a model system. *American Journal of Community Psychology*, *26*(2), 281-306.

Hastings, R. P. & Johnson, E. (2001). Stress in UK families conducting intensive home-based behavioral intervention for their young child with autism. *Journal of Autism and Developmental Disorders*, *31*(3), 327-336.

Herring, S. C. (2001). Computer-Mediated discourse. *Handbook of Discourse Analysis*, 612-634.

Hew, K. & Hara, N. (2007). Empirical study of motivators and barriers of teacher online knowledge sharing. *Educational Technology Research & Development*, *55*(6), 573-595.

McInnerney, J. M. & Roberts, T. S. (2004). Online learning: Social interaction and the creation of a sense of community. *Educational Technology & Society*, *7*(3), 73-81.

Noh, S., Dumas, J. E., Wolf, L. C., & Fisman, S. N. (1989). Delineating sources of stress in parents of exceptional children. *Family Relations*, *38*(4), 456-461.

Preece, J. & Maloney-Krichmar, D. (2003). Online communities: Focusing on sociability and usability. *Handbook of Human-Computer Interaction*, 596-620.

Reeves, T. C., Herrington, J., & Oliver, R. (2005). Design research: A socially responsible approach to instructional technology research in higher education. *Journal of Computing in Higher Education*, *16*(2), 97-116.

Rodgers, S. & Chen, Q. (2005). Internet community group participation: Psychosocial benefits for women with breast cancer. *Journal of Computer-Mediated Communication*, *10*(4), 5.

Shirky, C. (2003). Power laws, weblogs, and inequality. *Clay Shirky's Writings About the Internet*, *8*.

*W*enger, E. W. (2006, June). Communities of practice: A brief introduction. [Web page] http://www.ewenger.com/theory/communities_of_practice_intro.htm.

Wenger, E. (1999). *Communities of practice: Learning, meaning, and identity.* Cambridge Univ Pr.

Wenger, E., McDermott, R. A., & Snyder, W. (2002). *Cultivating communities of practice: A guide to managing knowledge.* Harvard Business Press.