Supported Student Success: Communities of Practice in Higher Education

Aimee deChambeau, The University of Akron
Supported Student Success: Communities of Practice in Higher Education

Aimée Lynn deChambeau

Submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy
from
Prescott College
in
Sustainability Education

May 2014

Beverly Santo, Ph.D.    John Savery, Ph.D.    Noël Cox Caniglia, Ph.D.
Committee Member      Committee Member      Committee Chair

Noriko Hara, Ph.D.
External Expert Reader
Copyright © 2014 by Aimée Lynn deChambeau

All rights reserved.

No part of this thesis may be used, reproduced, stored, recorded, or transmitted in any form or manner whatsoever without written permission from the copyright holder or her agent(s), except in the case of brief quotations embodied in the papers of students, and in the case of brief quotations embodied in critical articles and reviews.

Requests for such permissions should be sent to:

Aimée deChambeau
151 Stephanie Rose Lane
Enon Valley, PA 16120
adechambeau@gmail.com
Dedication

To Olivia, Alex, Sara, Freddy, and Marie.

May you always find the best communities of practice to support your continued learning and growth.
Abstract

This research tells a story about how students form communities of practice that help them succeed in graduate school. Told within the context of individual and collective experiences, it holds valuable lessons for how student success can be supported across the higher education landscape. Communities of practice can develop spontaneously when individuals involved in a common activity or with a sense of shared identity come together to deal with organizational complexities or establish a forum for continued learning. The practice of becoming an accomplished and successful student who is able to develop scholarly abilities and deepen disciplinary understanding, experience personal growth and achievement, while at the same time maintaining a healthy school-work-life balance is a non-trivial exercise. Membership in a community of practice can help students achieve success as part of the process of navigating this complex journey. Generously informed by the experiences of Prescott College Sustainability Education doctoral students, this research used survey responses, anecdote circles, interviews, and grounded theory methods to determine how communities of practice develop among graduate students in support of their success. This presentation asks and answers questions about what communities of practice are, how and why they develop, and what value they can bring to higher education.

*Keywords:* student success, community of practice, graduate education, sustainability education, sustainable education, higher education
# Table of Contents

Chapter 1: Communities of Practice in Support of Graduate Student Success .......................... 14  
Background and Context ........................................................................................................... 14  
Problem Statement .................................................................................................................. 16  
Statement of Purpose and Research Questions ....................................................................... 16  
Research Approach .................................................................................................................. 19  
Assumptions ............................................................................................................................. 23  
Researcher Positionality .......................................................................................................... 23  
Rationale and Significance ....................................................................................................... 29  

Chapter 2: Literature Review ................................................................................................ 32  
Caveats on Style ....................................................................................................................... 32  
The Literature: Communities of Practice and Graduate Education ........................................ 32  
The Literature: A Paradigm Change to Sustainable Education ................................................ 33  
Communities of Practice ......................................................................................................... 34  
  Situated learning and legitimate peripheral participation ......................................................... 40  
  Temporal aspects of communities of practice ........................................................................ 42  
  Identity, belonging, and communities of practice .................................................................. 45  
  Storytelling and community of practice ................................................................................ 48  
Communities of Practice Applied to Higher Education ............................................................ 49  
  Roles of communities of practice in graduate education ......................................................... 50  
Discussion of Themes .............................................................................................................. 57  
  Community of practice as a framework for analysis ............................................................... 57  
  Community of practice as a framework for reflection ............................................................ 61
<table>
<thead>
<tr>
<th>Supported Student Success</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community of practice as a learning strategy</td>
<td>63</td>
</tr>
<tr>
<td>Development of community of practice</td>
<td>67</td>
</tr>
<tr>
<td>Community of practice addressed within the context of multi-memberships</td>
<td>70</td>
</tr>
<tr>
<td>Roles of Communities of Practice in Graduate Student Success</td>
<td>73</td>
</tr>
<tr>
<td>Support or facilitation of community of practice development</td>
<td>74</td>
</tr>
<tr>
<td>Development of affective attributes and internal drivers for individuals</td>
<td>75</td>
</tr>
<tr>
<td>Impact on learning</td>
<td>76</td>
</tr>
<tr>
<td>Sustainable Education</td>
<td>77</td>
</tr>
<tr>
<td>Complexity, living systems, and sustainable education</td>
<td>80</td>
</tr>
<tr>
<td>Social learning, communities of practice, and sustainable education</td>
<td>82</td>
</tr>
<tr>
<td>Chapter Summary</td>
<td>85</td>
</tr>
</tbody>
</table>

Chapter 3: Research Design and Methodology | 86   |

| Context: History of the Prescott College Ph.D. Program in Sustainability Education | 87   |
| Study Site and Participants | 94   |
| Participant pool | 95   |
| Total study participation | 97   |
| Influences on Research Design | 98   |
| A qualitative, mixed methods approach | 98   |
| Influence of systems thinking | 99   |
| Influence of appreciative inquiry | 102  |
| Ethical Considerations | 104  |
| Participant protection | 104  |
| Informed consent | 105  |
Anonymous data ....................................................................................................................................... 105
Conflict of interest statement .................................................................................................................. 106
Research Design: Methods ..................................................................................................................... 107
Grounded Theory .................................................................................................................................... 107
Verification in grounded theory method ................................................................................................ 109
Data Collection Methods ...................................................................................................................... 110
Participant Observation ........................................................................................................................ 115
Survey ..................................................................................................................................................... 115
  Rationale .............................................................................................................................................. 115
Survey design .......................................................................................................................................... 116
Survey distribution ................................................................................................................................. 118
Self-selection via surveys ...................................................................................................................... 119
Survey analysis ....................................................................................................................................... 119
Anecdote Circles ..................................................................................................................................... 120
  Rationale .............................................................................................................................................. 120
Instrument development ....................................................................................................................... 121
Anecdote circle recruitment .................................................................................................................... 122
Anecdote circle sessions ........................................................................................................................ 123
Delivering the prompts .......................................................................................................................... 125
Recording, transcription, and safeguarding data .................................................................................... 125
Anecdote Circle data analysis ................................................................................................................. 126
Interviews ................................................................................................................................................ 128
  Rationale .............................................................................................................................................. 128
Instrument development ........................................................................................................ 128
Recruitment of participants ................................................................................................ 129
Brief description of the interview process ......................................................................... 131
Recording and safeguarding of data .................................................................................. 131
Analysis ............................................................................................................................... 132
Methods and Data Analysis Summary ................................................................................ 132

Chapter 4: Findings ........................................................................................................... 133
Student Characteristics ....................................................................................................... 135
Demographic and contextual information about the students based on the survey ........ 135
Definition of success from the study participants ............................................................. 141
Digital Habitats .................................................................................................................. 142
Preferred Communication Methods ................................................................................... 144
Survey results regarding communication preferences ..................................................... 145
Communicating with individuals in the same cohort ......................................................... 145
Communicating with individuals from other cohorts ....................................................... 146
Communicating with small groups .................................................................................... 147
Communication needs and strategies revealed in anecdote circles and interviews ....... 149
Impact of Social Media on Student Communication ....................................................... 153
Community of Practice Characteristics .......................................................................... 156
Meaning ............................................................................................................................... 156
Negotiation of meaning ..................................................................................................... 157
Participation ......................................................................................................................... 159
Reification ............................................................................................................................ 163
<table>
<thead>
<tr>
<th>Appendix</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Code Tree</td>
<td>216</td>
</tr>
<tr>
<td>B</td>
<td>Survey Instrument: Alumni</td>
<td>221</td>
</tr>
<tr>
<td>C</td>
<td>Survey Instrument: Current Students</td>
<td>227</td>
</tr>
<tr>
<td>D</td>
<td>Anecdote Circle Themes and Prompts</td>
<td>233</td>
</tr>
<tr>
<td>E</td>
<td>Interview Instrument</td>
<td>235</td>
</tr>
<tr>
<td>F</td>
<td>Informed Consent: Survey</td>
<td>237</td>
</tr>
<tr>
<td>G</td>
<td>Informed Consent: Anecdote Circle</td>
<td>241</td>
</tr>
<tr>
<td>H</td>
<td>Informed Consent: Interview</td>
<td>244</td>
</tr>
</tbody>
</table>
# Table of Tables

Table 1 Chunking the Guiding Questions into Contextual Categories .................................................. 19
Table 2 Evidence of Support and Facilitation of Community of Practice in Graduate Education ............... 75
Table 3 Evidence of Community of Practice Supporting Affective Development .............................. 76
Table 4 Evidence of Increased Learning When Community of Practice Applied in Graduate Education ................................................................................................................................. 77
Table 5 Students Participating in Each Data Gathering Method and Cohorts Represented ................. 98
Table 6 Types of Information Study Intended to Gather, the Expected Data Within Each Type, and Methods for Collecting Data........................................................................................................ 112
Table 7 Examples of Information Types Collected with Survey ......................................................... 117
Table 8 Examples of Information Types Collected with Anecdote Circles ........................................ 122
Table 9 Anecdote Circle Participants .................................................................................................. 123
Table 10 Examples of Information Types Collected with Interviews ............................................... 129
Table 11 Characteristics of Interviewees ............................................................................................. 131
Table 12 Time to Completion of Last Degree .................................................................................... 136
Table 13 Household Structure ........................................................................................................... 137
Table 14 Dependents at Home ............................................................................................................ 138
Table 15 Fears About Completing Degree .......................................................................................... 138
Table 16 Fears About Completing Degree: Reasons ........................................................................ 139
Table 17 Age Ranges .......................................................................................................................... 140
Table 18 Gender ................................................................................................................................... 141
Table 19 Communicating with Individuals in the Same Cohort ......................................................... 146
Table 20 Communicating with Individuals in Different Cohorts ........................................ 147
Table 21 Communicating with Small Groups ........................................................................ 149
Table 22 Findings Based on Initial Guiding Questions .......................................................... 189
Table 23 Sterling’s Whole Systems Shift and Prescott College’s Graduate Student Community of Practice ............................................................................................................... 201
Table of Figures

Figure 1. Concept map linking reviewed literature to categories of community of practice theory applied in graduate education, and also to the indicators of how those applications contribute to student success ................................................................. 56

Figure 2. Three categories emerge—support and facilitation, internal drivers, and impact on learning—where student success is enhanced by the application of community of practice theory in graduate education. Evidence of impact in each category is displayed in this figure. .......... 74

Figure 3. Study participants ..................................................................................................................................... 97

Figure 4. Elicitation of perceptual information from participants. Each method is presented here, with corresponding questions or prompts intended to capture perceptual information ........... 113

Figure 2. Elicitation of anecdotal information from participants. Each method is presented here, with corresponding questions or prompts intended to capture perceptual information .......... 114
Chapter 1: Communities of Practice in Support of Graduate Student Success

This research study seeks to determine whether a community of practice develops among doctoral students enrolled in a particular cohort-learning program and, if so, whether it functions as a supportive structure that enables students to succeed through graduation. Using the Prescott College Ph.D. program in Sustainability Education as the test bed, this study examines various dimensions of the student cohorts to determine if community building fostered early in the program continues as membership in a community of practice through subsequent years until graduation and beyond. Further, it identifies intergenerational communication between cohorts and communication patterns among students that are relevant to moving new students from their peripheral positions as novice Prescott College Sustainability Education doctoral students along the trajectory to more accomplished students who meet the requirements for graduation. A grounded theory approach is used in analyzing the corpus of data gathered, with the intention of formulating a theory of supported student success.

Background and Context

A community of practice, as defined by Jean Lave and Etienne Wenger (1991) “… is a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice” (p. 98). In this sense, the practice that a community centers around is the shared activity in which the members are, or wish to become, practitioners. This might be, for example, a profession such as public defender (Noriko Hara, 2009) or copy machine repairman (Julian Orr, 1996; Andrew Cox, 2007). In the context of this study, the practice in question is that of becoming a successful student who is able to develop scholarly abilities and deepen disciplinary understanding, experience personal growth and achievement, while at the same time maintaining a healthy school-work-life balance.
Lave and Wenger further described “a community of practice [as] an intrinsic condition for the existence of knowledge… because it provides the interpretive support necessary for making sense of its heritage” (1991, p. 98). With respect to the graduate student experience, this means that a community of practice could provide a social structure within which students can learn from one another what their roles and responsibilities as students are; what resources, skills, and tools are relevant and available; and receive help and critical feedback when navigating theory, method, and research design. A graduate student community of practice could also provide emotional support and practical advice when students must continuously balance their school-work-life obligations and priorities. In addition, a community of practice could serve to interrupt any periods of isolation students may experience during their academic work.

This research looked specifically at the beneficial outcomes of communities of practice, although it should be acknowledged that it is possible for communities of practice to have a negative impact on their members. For example, a negative community of practice is one that becomes an echo chamber where members simply repeat, or echo, the status quo and do not move forward or continue to learn, but rather reinforce only what they already believe.

Robust communities are self sustaining and long lived, which implies that they have continuing value to their members over time. This research determined whether robust communities of practice existed within a graduate program, as opposed to those that develop and disperse in relatively fleeting moments. The findings of this study indicated that there is a community of practice that is developing, and that as students continue to develop the connections, communication tools and strategies, and the artifacts necessary to support a community of practice over time, it will become more robust.
This research examined the communities of practice that are encouraged, nurtured, and develop spontaneously among the students within the Prescott College Ph.D. program in Sustainability Education and how they contribute to the formation of a larger community of practice. Students come to this program from a range of backgrounds, and they bring with them a variety of experiences as professional practitioners in different fields. This study, however, concentrated specifically on their practice of becoming—and then being—successful Sustainability Education graduate students. This research, and the individuals, cohorts, and communities of practice studied are naturally bounded by the intellectual, professional, and temporal space they occupy between being admitted to, and graduating from, the Ph.D. program.

**Problem Statement**

Communities of practice can develop spontaneously when individuals involved in a common activity or with a sense of shared identity come together to deal with organizational complexities or establish a forum for continued learning. Given that the practice of becoming an accomplished and successful student who is able to develop scholarly abilities and deepen disciplinary understanding, experience personal growth and achievement, while at the same time maintaining a healthy school-work-life balance is a non-trivial exercise, how might students foster communities of practice that help support their success in this endeavor?

**Statement of Purpose and Research Questions**

Communities of practice, similarly defined learning communities, and cohort models are all used to varying degrees and in different combinations to provide structural learning support in graduate education. Students are brought together and generally stay together through the course of their graduate work. Communities that are nurtured from the outset—or develop spontaneously—can provide a social, collaborative work context within which learning takes
place. Students are thus able to engage with one another, with ideas and concepts, and with their own past and developing experiences within their practice (i.e., the work that they do) and co-create knowledge.

A great deal of published research exists which addresses the use and effectiveness of different types of community structures and models such as communities of practice, learning communities, or cohorts (Marie Kraska, 2008; David Rausch & Elizabeth Crawford, 2012) that enable graduate students to become better practitioners in their field of study such as high school math teachers, nurses, or ESL teachers (Sharon Elizabeth Booth, 2011; Peg Boyle & Bob Boyce, 1995; Rebecca Clark, 2010; Merrilyn Goos & Anne Bennison, 2008; Christopher Johnson, 2006). Very little research, however, addresses just the practice of simply being a successful student at the graduate level (Steve Bain, LaVonne Fedynich, & Melody Knight, 2009; Debbie Hahs, 1998; Miia Martinsuo, & Virpi Turkulainen, 2011; Cathy McHugh Engstrom & Vincent Tinto, 2008; Vincent Tinto, 2005). When similar individuals end up in the same academic cohort—for example, elementary school teachers who are continuing their education—it is possible that the community model works especially well because the students bring their experiences of a common work practice into their class discussions and coursework, supporting one another and co-creating knowledge relevant to their professional work outside of the practice of being graduate students.

This study, on the other hand, focused on student development from novice to experienced graduate student and thus helps deepen the available research in the area of student support and success. The goal was to formulate a theory of supported student success that can inform graduate program development in ways that will help nurture students in their role of becoming and being successful. This type of support within a community of practice enables
individuals to achieve success as students, independent of the discipline within which they are enrolled.

This research first determined whether a beneficial community of practice developed within the Ph.D. graduate student group. It then examined how this community of practice is sustained and how knowledge about becoming and being a successful graduate student is co-constructed through the exchange of stories within and across cohorts. Stories not only relay information and contribute to the co-creation of new knowledge, but they also serve a role in building and sustaining the community itself. In this study, stories are specific experiences and anecdotes that are shared to help guide, encourage, instruct, or develop fellow students within the context of their success as graduate students in the Prescott College Ph.D. program. Because this is a newly developing community of practice, any opportunities for students to come together, develop bonds and relationships, and begin to share advice and ask questions of one another become especially important in building and strengthening the community.

Questions that helped guide and focus the research included:

- Do robust communities of practice exist and/or develop within and between cohorts?
- How do subgroups connect across cohorts in effective, meaningful ways? For example, by discipline, topic, shared interests, etc.
- Where and how are stories being shared?
- Are there enough opportunities for sharing stories?

The guiding questions can be chunked into larger contextual categories. This helps in understanding the research design, and how mixed methods capture both similar and different kinds of data. These larger categories are easier to use in matrices that show how types of information are gathered by which instrument. See Table 1.
Table 1

*Chunking the Guiding Questions into Contextual Categories*

<table>
<thead>
<tr>
<th>Overall Context</th>
<th>Guiding Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement</td>
<td>• Does the information and knowledge being shared in stories help individual students to complete their work effectively, moving smoothly through a trajectory from novice to experienced graduate student or researcher?</td>
</tr>
</tbody>
</table>
| Cross cohort communication                           | • Do robust communities of practice exist and/or develop within and between cohorts?  
• How do subgroups connect across cohorts in effective, meaningful ways? For example, by discipline, topic, shared interests, etc.                                                                                                                                                                                  |
| Physical, virtual, and intellectual opportunities for sharing | • Where and how are stories being shared?  
• Are there enough opportunities for sharing stories?                                                                                                                                                                                                                                                                                                                |
| Temporal context                                     | • Do stories help to keep a single cohort together over the course of the students’ enrollment? More specifically, what happens to the community of an individual cohort between the second and third year, based on their (storytelling) communication patterns?                                                                                                                      |

**Research Approach**

With appropriate Institutional Review Board permission, I used a survey, anecdote circles, and interviews to gather explicit data from participants about how a beneficial community of practice develops; where, when, and how the exchange of information and the development of knowledge that moves students toward success takes place; and ways in which those exchanges can be encouraged, facilitated, and nurtured. The participants in this study were drawn from the entire pool of current and graduated students in the Prescott College Ph.D. program in Sustainability Education, which at the time of the study included Cohorts 1-8. A total of 85 survey invitations were sent, and 41 were completed and returned. Anecdote circle participation was open to all Ph.D. students attending the Spring 2013 Sustainability Symposium. Three separate anecdote circles were facilitated, gathering three recorded hours of data from a total of 15 participants. Interview invitations were only sent to survey respondents.
who indicated that they were willing to be contacted. Six interviews were conducted, with an
interviewee drawn from each of Cohorts 3-8.

This study used a grounded theory approach to formulate a theory of supported student
success (Anselm Strauss & Juliet Corbin, 1990; Antony Bryant & Kathy Charmaz, 2007;
Melinda Birks & Jane Mills, 2011). This approach was based on whether a community of
practice developed among doctoral students in order to support them in their practice of
becoming and being successful students. This study operationalized a community of practice
framework based on Lave and Wenger’s original model (1991) and Wenger’s (1998) extended
model in order to fully define communities and sub-communities of practice within and across
cohorts in the Prescott College Ph.D. program in Sustainability Education. It also borrowed tools
and concepts from the digital ecosystems model set forth by Etienne Wenger, Nancy White, and
John D. Smith (2009) in their book Digital Habitats, and used them to unearth and describe in an
organized way the various modes of communication cohorts use in order to stay connected,
including the use or lapsed-use of those modes over time.

According to Wenger, White, and Smith (2009), communities require habitats to thrive
(p. 38) and in many respects this research identified those habitats, both traditional and digital, in
which graduate students’ sub-communities of practice thrive. To this habitat metaphor I have
added the notion of microclimate, to help differentiate between the habitat itself and the
characteristics or qualities of a communication space that protects the habitat, nurtures its
growth, or even simply permits it to emerge. Survey responses, historical information from
college documents and social media sites, and interview data were collected in order to sketch a
general portrait of the communities and sub-communities that develop and the communication
strategies that help hold them together. While this data helped set a deeper context for the role
that stories and storytelling play within the community of practice, it also inspired a shift in the conceptual framework for this study.

This research originally intended to explore most deeply the current role(s) of stories and storytelling within and between cohorts, and the impact of stories on individuals’ success as students. Data collection for this aspect of the study was accomplished primarily through survey responses, interviews, and anecdote circles crafted to identify and elicit stories and specific examples of student experiences. However, an important discovery from analysis of this data is that while a community of practice is emerging—while it is in its nascent stages, as is the one under study here—the points of contact where stories can be exchanged become as important as the stories themselves.

Storytelling is a knowledge-exchange activity and knowledge-exchange, both practical and cultural (Hara, 2009), is a fundamental feature of communities of practice; it is one of their greatest strengths especially when contrasted with systems that simply manage content (e.g., a knowledge base, or a wiki, or a website). David Snowden (2002) proposed a set of heuristics that provide a good insight into why knowledge exchange is more important than simple content management within an organization or, as in this case, within a community. According to Snowden (2002):

1. Knowledge can only be volunteered; it cannot be conscripted. … 2. We can always know more than we can tell, and we will always tell more than we can write. … [and] 3. We only know what we know when we need to know it. (p. 102)

For example, stories carry more information than written manuals (i.e., content management) and are easier to place with any given context, making them more meaningful to the teller and the listener. To do this, however, there needs to be a place for the storyteller and the listener to interact; for the story to, perhaps, unfold spontaneously in conversation and for the
listener(s) to be able ask questions or provide cues that encourage the storyteller to share more of his or her experience.

Thus, given that story-sharing is important in the co-creation of knowledge within a community, and given that this study has found that a nascent community of practice within the graduate student community does exist, it became important to take one step back from the stories themselves and re-emphasize questions such as “Where are the stories being told?” and “Are there enough opportunities for sharing stories?” Making a shift in order to emphasize the importance of the answers to these questions about opportunities for sharing, elevating them from contextual markers to essential ingredients in the development of a theory of supported student success reliant on a community of practice, has helped me more fully describe and understand how this process takes place.

The grounded theory methods used in this research specifically allowed for emergence of new and even unexpected perspectives from the data. It also encouraged iterative cycling of what the research found back into the data as part of the analytical process, i.e., constant comparative analysis (Birks & Mills, 1990, p. 94). The data gathering for this study was done within the boundaries of the communities of practice framework and was primarily focused on collecting stories relevant to the practice of becoming and being a successful graduate student in the field of sustainability education. Data indicated that a community of practice is likely in the earliest stages of its development. Questions about where and when students come together to share stories were addressed in the data gathering phases, and given that data suggested an early community of practice, it emerged that those opportunities became as important within the context of this research as the stories themselves. Virtual and physical times and places when the most influential stories are shared were identified, but because the community under study is just
emerging as a community of practice, those opportunities for sharing take on a new level of importance. Participants in this study, over time and even now, are searching for the best ways to communicate with one another as individuals and collectively, and to maintain that communication over the course of the program. Thus, as this qualitative analysis was initially about how students are coming together to support each other’s personal success, it also revealed the importance of opportunities for sharing and bonding, and of nurturing the microclimates where relationships and communication strategies solidify into critical nodes within a vibrant network that can support the collective success of the community.

Assumptions

An underlying assumption of this research is that as relationships and communication rhythms develop within and among cohorts, essential information that contributes to the success of the students is exchanged through the sharing of stories and advice based on experience. Given a sufficiently strong and focused network of relationships and communication patterns, a community of practice can develop that supports students in their practice of becoming and being successful students.

Researcher Positionality

I have been librarian and an educator for the entirety of my career. For nearly 25 years I’ve taught information literacy, computer literacy, and library science at all levels from K-12 through higher education. As a librarian I firmly believe that information literacy provides a basis for lifelong learning, and that libraries of all types enable individuals to develop and use these skills to both entertain and educate themselves continually. The foundation, then, of what I do as an educator and a librarian is based in an interest and belief in helping people develop skills that enable them to continue to learn across their lifetime as self-directed learners.
My interest in lifelong learning is what led me to enter the Prescott College Ph.D. program in Sustainability Education, because I see lifelong learning as a sustainability issue. Education as sustainability is a way of thinking that is deeply rooted in a systems perspective. This is critical for “studying things in terms of their connection, context, and relationships to the whole” (Harriet Goldman, 1999, p. 17). Problems within systems are complex and multidimensional and lifelong learning skills such as information literacy enable individuals to continue to explore what is known, critically evaluate how that applies within their own and a global context, ethically manage and present information, and incorporate new understandings into their current knowledge base. Harold Glasser made a very clear connection for me between the fundamental information literacy skills that I work to instill in students, and sustainability education. Glasser (2009) wrote that

information is not knowledge, and knowledge is not understanding. The promise and power of learning for sustainability involves internalizing this distinction and learning to appreciate that understanding results from access to information, the capacity to make sense of it, the opportunity to openly debate its significance, the sophistication to draw meaning from it, and the wisdom to put it into context. (pp. 56-57)

This neatly summed up for me the notion that learning for sustainability relies upon individuals having the capacity to find and use information effectively. Further, that individuals are skilled in working with and negotiating meaning from information in a social context. There is a combination of self-directed learning and social co-construction of knowledge that must take place in order to effectively deal with the types of complex sustainability issues that arise at the regional and global scales.

Although librarians do interact directly with students, they often have a less direct role in a student’s formal learning and thus work conscientiously to create a structure within which library patrons can succeed through a combination of self- and mediated-services. As a librarian,
I have worked closely with teaching faculty to integrate information literacy skills into their curricula for example, while also producing materials and designing interfaces to bolster successful student experiences when they must navigate an overwhelming amount of information. My desire to create better learning opportunities and tools for students is driven by an ultimate interest in student success. In the case of my dissertation research, and in the case of my position as a faculty member and administrator in higher education, I refer to success for students in the traditional, student-in-school sense. However, I do believe that every person is always a student, and that people are constantly in a state of learning, un-learning, and re-learning whether or not they realize it.

This constant state of learning often happens because of, and within, social relationships and interactions. In fact, the majority of the learning that individuals do every day—and that they might never even notice—is happening through direct and indirect interactions with others. You and I might have a discussion, or I may read your research paper, or we might go and watch a play together and discuss it with strangers in the lobby during intermission. You might be a student working independently in the library, using a research pathfinder that I have created for your topic. There is always some kind of exchange taking place and, generally, learning is happening as well.

My personal interest in this social co-construction of knowledge, which to a certain extent has resulted in this dissertation research project, has grown from two particular experiences. As an undergraduate I was introduced to what is sometimes known as the hundredth monkey effect or theory. To me, it does not matter if this is a real theory or even if it is based on a true story. Although this story is more about the social sharing of information than about true co-creation of knowledge, the important and most influential part for me is that learning is based
on an exchange—in this case, imitation—and that the learning can spread exponentially throughout a community. Briefly, the salient points for me from the hundredth monkey story are as follows: Monkeys on an island were introduced to yams. They liked the yams, even though they were covered with sand. One day, a young female monkey began washing her yams in the water, which eliminated that sand and made them taste better. Her mother saw her, imitated the behavior, and was rewarded with a clean and tasty yam. Soon, all the monkeys had learned to wash the sand from their yams before eating. There is more to the story, including a spontaneous leap in overall monkey-consciousness that is interesting, but not relevant to my point, which is simply that good ideas and useful skills are learned and spread quickly through a community, especially when community members are paying attention to, observing, and collaborating with one another. With this dissertation research I build upon this idea that begins with social sharing of knowledge and explore active social construction of knowledge where individuals are mutually engaged in negotiating meaning.

When I teach library science courses at the graduate level, I use this story as a prompt for discussing the differences between simply retrieving information for library patrons versus engaging in teachable moments when librarians can help them learn how to find and use information on their own, and whether those patrons might go on to share what they have learned with others. How librarians interact with and instruct individuals and groups depends on needs of the individual, the context for their inquiries, and the relationship between them and their librarian. With respect to my dissertation research, I want to know what students are learning about managing their lives and obligations as students, and how they are exchanging and sharing that information with other students so that they may learn as well, and through that learning succeed in reaching their goal.
Teaching entirely online graduate-level courses in library science is the second important experience that motivates me to learn more about socially supported learning and co-creation of knowledge. I am increasingly curious about the differences in how students interact with one another in online versus hybrid versus face-to-face situations and what adaptations can be made to any of these modes to increase their effectiveness. I anticipate that eventually a new paradigm for interactions in online learning will develop that will necessarily be different from face-to-face interactions. While this dissertation research is not about online learning per se, it does provide insights into communication patterns and social support of learning within a hybrid educational model; and I do plan for this to be a foundation for more research addressing the differences and similarities among educational modes-of-delivery models as they relate to supporting student success.

As an educator I am also always concerned with developing and improving my own skills as a teacher, and my own understanding of how learning takes place in both formal and informal environments. I have completed training through the Association of College and Research Libraries’ Information Literacy Institute as well as the Scholarship of Teaching, Learning, and Assessment program at the University of Akron. Participation in these programs has deepened my appreciation of and support for initiatives within educational organizations—particularly in higher education—that promote and foster a scholarship of teaching and learning culture that supports the continued growth of teaching skills for faculty and the creation of better learning opportunities for students. This constant search for improvement as an educator is also one of the reasons I am conducting advanced research in the area of sustainability education, specifically addressing how students support one another in order to achieve success as students. Results
from this research can inform program design and development and thus contribute to the overall scholarship of teaching and learning literature.

My background and experiences in teaching at various educational levels using different modes of delivery, and in the development of educational materials and tools to support student learning and ultimately success certainly influences why I pose the research questions that I do, and how I interpret the data. Even more influential, however, is my role as a doctoral student within the Prescott College program that serves as the test bed for this research. I use personal observations and experiences as a participant within the community under study to help direct the flow of questions and to pinpoint areas that I believe are important to address. Having had students from earlier cohorts specifically provide advice to me and a few of my Cohort 5 peers about choosing mentors, for example, makes me wonder and ask if this is a conversation that continues across newer cohorts. Knowing where we were when other students shared some of their most important stories about being a student makes me wonder and ask about locations—physical and virtual—and how that affects cross-cohort communication and community building. Conversely, I acknowledge that I am not as connected with as many of the other students in the program as I could or should be, and this has the potential to cause blind spots in my observations. If something unfamiliar is revealed in the data, however, I recognize that I may need to investigate further to understand that unfamiliar point. For example, students now have shared one-credit seminar courses that were not fully developed as a concept when I was in my third and fourth years. Hence, I was initially unfamiliar with them when they were first mentioned in an anecdote circle and needed to investigate further to more fully understand their development, structure, and use.
By acknowledging my position as a student within the program under study, and using some—but not all—of my experiences in the context of being a participant observer help me to separate any personal bias from aspects of community, communication, and student success that I actually want to study. I worked conscientiously to overcome potential biases by reflecting and writing memos on whether I was asking a question or interpreting a piece of data based on my own personal experience or based on what I have observed as others’ experiences.

Using grounded theory as a method is also useful because it asks that the researcher interrogate or interpret the data in various ways specifically in order to help reduce potential bias, for example, with procedures that help researchers break through assumptions (Strauss & Corbin, 1990). This is not the only reason I choose to use grounded theory, but its value in reducing bias is a certainly a factor. Another reason for using grounded theory is that I want to produce a research design and a set of data and interpretations that is transferable beyond the Prescott College program; using the grounded theory approach to analyze the data with the intention of actually formulating a theory of supported student success is intended to help achieve that goal.

My goal is to hear the voices of the participants and allow them to speak for themselves in the presentation of the data, especially though the use of exact and unedited quotes. When paraphrasing or otherwise changing exact words of participants, I am careful to accurately represent their spoken intent or meaning. In addition, to acknowledge the contributions of women researchers upon whose work I draw, I use complete author names the first time they appear in the text of this dissertation, and in all of the references at the end.

Rationale and Significance

Although student success is recognized as a critical issue in higher education, research on the topic from a scholarship of teaching and learning perspective focuses primarily on
undergraduate student success (Boyer Commission, 1998; Antonia Cortese, & Brian Kennedy, 2011; Alan Seidman, 2005) and relatively little current research is concerned with graduate student success at the doctoral level. The exception to this is research on predicting success, which primarily focuses on what indicators such as GRE scores best predict whether students will complete their graduate degree (for example, Nancy Burton & Ming-Mei Wang, 2005; Suchitra Gururaj, Julian Heilig, & Patricia Somers, 2010), or enrollment and completion trends (see, for example, Stephanie Nevill, Xianlei Chen, 2007). Depending on what broad fields and disciplines are surveyed, between 43-50% of graduate students will not persist to graduation even over a ten-year span (Robert S. Sowell, Nathan E. Bell, & Sheila Nataraj Kirby, 2010; Vincent Tinto, 1993). The lack of broad-reaching research on success-as-persistence at the graduate level is changing with the Ph.D. Completion Project by the Council of Graduate Schools, which is providing solid baseline data, but is still limited by the nature of collecting commonly available, standard data across institutions. The Ph.D. Completion Project looks at policies and practices that institutions can implement as interventions within the categories of selection and admissions, mentoring and advising, financial support, research mode of the field, curricular and administrative processes and procedures, and program environment (Sowell, Bell, & Kirby, 2010, p. 6). My dissertation research into communities of practice in support of graduate student success provides additional data in support of, and in addition to, the Ph.D. Completion Project’s recommendations in the areas of mentoring and advising, curricular and administrative processes and procedures, and program environment.

Designing and facilitating better ways to support students in their practice of being successful students has great potential for improving persistence within individual programs. My intent with this research is to describe the ways in which a community of practice can develop
among graduate students and to identify the aspects of the community of practice that most benefit students in terms of their overall success. The results of this research can assist programs in recognizing when a community of practice is developing so that it can be encouraged and nurtured. It can also identify strategies used by students that programs can imitate in support of student success. This research thus provides valuable information about the ways in which a graduate student community of practice develops and adapts in order to sustain its community-self, as well as sustain the individuals from which it is comprised. This understanding of student communities of practice can inform institutional planning for better provision of student services and further fostering of community in order to support student success.

Although this study is constrained to a specific program, it is expected that elements identified as important to the practice of being a successful graduate student can be applied widely throughout other programs. It is further expected that the overall design of this research can be easily replicated and used to study various types of graduate programs such as online only, residency only, and hybrid programs to determine if and/or how students are supporting one another. Ultimately, comparisons across types of programs could lead to insights into ways institutions might better support students in general, and when they should tailor support, depending on program type. This study will thus contribute solid data against which other programs, as well as future action research, can be measured.
Chapter 2: Literature Review

After a brief discussion of search strategies, this review of the literature first addresses in detail the origin of the concept and theory of communities of practice, followed by a brief comparison to other types of learning communities. Following that, I look closely at very specific applications of communities of practice in graduate education and briefly discuss how those applications contribute to student success. I then briefly introduce ideas from some of the main thinkers and authors calling for a paradigm change in higher education to one of sustainable education. The review concludes with a few comments on ways in which sustainability education in higher education—i.e., sustainable education—can be influenced by program or curricular design, such as the inclusion or encouragement of student communities of practice.

Caveats on Style

Throughout this document I use a modified APA style for citations and references in order to more fully recognize each individual researcher’s contribution. My research and presentation of the results are influenced by feminist theory and perspective; thus I use this modified APA style to increase visibility of research, collaboration, and writing by women. The first time a work is referenced in the text, for example, the full name of the author(s) is listed. Subsequent in-text citations for that work use only the last name. Full names are also used in the list of references.

The Literature: Communities of Practice and Graduate Education

The literature reviewed for this research is drawn primarily from the fields of education and business. The main threads used to focus the search were communities of practice,
storytelling for the purposes of organizational learning, and student success at the graduate level. Within education, the focus was on materials that addressed communities of practice in higher education and, to a much lesser extent, related organizational structures such as learning communities. Also within the education literature, graduate education, cohort models in graduate education, communities of practice, situated learning, and related concepts were searched. When closely aligned with the educational concepts outlined previously, materials addressing distance learning, online learning, hybrid learning models, and residency (i.e., face-to-face) modalities were all included. Priority was given to research on education focused on sustainability, or programs that are transdisciplinary in nature, so as to closely parallel to the Prescott Program.

From the business literature, the areas of communities of practice, learning organizations, and storytelling for organizational knowledge were all included. To a lesser extent, network analysis materials from the computer and information science disciplines were also included, if they related specifically to communities of practice or cohort experiences in graduate education.

The Literature: A Paradigm Change to Sustainable Education

In the second section of this literature review I focus on sustainability in higher education. Most specifically, I briefly present research and writing that addresses or calls for a paradigm change in teaching, learning, and the organizational structure of higher education. General searches for sustainability education or education for sustainable development in the education literature yielded far too many articles and monographs dedicated to the greening of higher education, the integration of only environmental studies into the curriculum, or very specific case studies in integrating sustainability principles into coursework.

Faced with unwieldy results that did not connect closely enough to my research agenda—although individually important within the overall sustainability education context—I changed
my search strategy to track articles referenced by, or citing, those authors with whom my own research interests and goals align. This approach allowed me to locate research and writing about social learning and sustainability in higher education, whole systems thinking and organizational change related to sustainability education in higher education, and transformation of higher education to better address sustainability issues. The most influential authors for me were Stephen Sterling and James Pittman, and the most influential editor and author was Arjen Wals. A few edited monographs proved to be useful, as they gathered together applicable works by different authors. I located additional related materials using reference lists accompanying the chapters from these collections. I also used the Web of Science’s cited reference search across the Science, Arts and Humanities, and Social Science citation indexes to locate relevant articles.

**Communities of Practice**

Jean Lave and Etienne Wenger’s 1991 book *Situated Learning: Legitimate Peripheral Participation* is generally treated in the literature as the first use of the concept of communities of practice to analyze the ways in which learning takes place within a social context. Danny Wallace (2007) recorded that the phrase was in use at least as far back as 1864 when it described a relationship between religious groups, and in 1878 when it “described the commonalities of the publishing industries in France and England” (p. 38). Wallace further found that it was again used with respect to religious organizations in 1882 and 1932, as well as in describing the practice of attorneys in 1957 and of psychiatrists in 1966 (2007, p. 38). For this research, however, I am specifically interested in Lave and Wenger’s early communities of practice concept as a learning model. Noriko Hara (2009) wrote that the concept of community of practice “provides us with a lens by which we can focus our understanding of informal collaborative learning” (p. 2) and Alison Fuller (2007) further explained that this invites “a focus
on learning as a collective, relational and … social process” (p. 19). As Fuller’s explanation implies, Lave and Wenger’s original communities of practice model is unique because it shifts the analytic focus away from learning as something happening strictly within the heads of individuals and onto learning as something taking place as part of coparticipatory processes within a social context (William Hanks, 1991, p. 13). In his forward to Situated Learning, William Hanks (1991) summarized this change in focus as situating learning “in certain forms of social coparticipation” instead of “defining it as the acquisition of propositional knowledge,” and that “rather than asking what kinds of cognitive processes and conceptual structures are involved, [Lave and Wenger] ask what kinds of social engagements provide the proper context for learning to take place” (p. 14).

Lave and Wenger studied research on apprenticeship and the ways in which participants moved from novice to experienced members of a trade (such as tailors or midwives) or other types of easily bounded communities with mentor-protégé relationships (such as non-drinking alcoholics in AA). Within education, apprenticeship is both a metaphorically and a historically specific way of learning, and as such it carries various connotations that can confound the learning concepts that Lave and Wenger wanted to address (1991, p. 31). Thus they chose to expand the variety of social constructs they could include by using situated learning as the key conceptual phrase, rather than be constrained by prior biases associated with apprenticeship as a specific way of learning or socialization into a discrete community. That being said, successful apprenticeships are great for studying situated learning because their boundaries are easy to define, and the ways in which learning takes place socially and contextually within those boundaries are thus easier to analyze.
The similarities between learning in an apprenticeship model and the situated learning that takes place within a community of practice are easy to see if you consider the importance of the social context for learning that takes place. A legitimate peripheral participant in the community of practice model is similar to an apprentice in that they are both part of a community engaged in a particular practice, and that they have “continual access to models of expertise-in-use against which to refine their understanding of complex skills” (Allan Collins, John Seely Brown, & Susan Newman, 1989, p. 456). Situated learning allowed Lave and Wenger to extrapolate from their data on apprenticeship learning and apply their theory to other types of—albeit somewhat intuitively defined—communities of practice. Communities of practice are crucial to this particular discussion of situated learning, and to Lave and Wenger’s theory, because they are the context, i.e., the situation, in which the situated learning takes place.

The inability to clearly define community of practice has allowed for many interpretations and definitions since Lave and Wenger proposed their theory of situated learning in 1991. Although this has in fact provided fodder for critiques of Lave and Wenger’s theory, I find that as long as an analysis follows some fundamental community of practice concepts (described in more detail below) and clearly describes what it is using as the characteristics and boundaries of the community of practice under study, then this lack of clarity in the theory actually provides opportunities for more creative research across a wide range of communities.

Very broadly described (even if “community” cannot easily be well defined or identified) membership in a community of practice “does imply participation in an activity system about which participants share understandings concerning what they are doing and what that means in their lives and for their communities” (Lave & Wenger, 1991, p. 98). Again, the idea of practice is a key concept in the identification of community of practice. For the purposes of this paper, in
fact, I prefer to restrict the concept of practice specifically to professional practice. As Etienne Wenger, Richard McDermott, and William Snyder defined practice in 2002, “it denotes a set of socially defined ways of doing things in a specific domain: a set of common approaches and shared standards that create a basis for action, communication, problem solving, performance, and accountability” (p. 38). Although community of practice, because of the elusive nature of a definition, can apply to a wide variety of groups of people who are concerned about a specific issue or interested in a particular topic, this research reflected on community of practice primarily as an analytical tool for improving formal, traditional higher education experiences. I fully recognize that community of practice and situated learning are often used as examples of alternatives to the formal, transmissive model of classroom instruction; this is the exact reason that I am interested in what can be learned from this theory in order to improve that of which it is fundamentally critical (i.e., transmissive education). That being said, there is also great value in lessons learned from the practical application of community of practice in diverse learning organization, human resource development, and knowledge management situations when their possibilities within higher education are considered.

For Lave and Wenger, a community of practice acknowledges that there is more to an apprenticeship, to use a specific example, than just learning a “technical knowledgeable skill [in situ]…. A community of practice is a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice” (1991, p. 98). Wenger (1998) further described a community of practice as a combination of three elements: a joint enterprise; a relationship of mutuality; and a shared repertoire. In 2011 Len Cairns iterated that Wenger had identified mutual engagement in a set of activities or practice, a joint enterprise, and a shared repertoire as three key characteristics of community of practice, and
further, that Wenger was clear that communities of practice were not at all synonymous with groups, teams, or networks (pp. 75-76). By 2002 Wenger and his colleagues Richard McDermott, and William Snyder, with an eye toward practical application in cultivating community of practice for organizational learning contexts, had redefined community of practice as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (p. 4).

Hara (2009), who studied informal learning for the professional development of public defenders, defined “communities of practice [as] collaborative, informal networks that support professional practitioners in their efforts to develop shared understandings and engage in work-related knowledge building” (p. 3). Hara’s definition is a good example of how a community of practice can be described in a way that is specific enough for targeting research and analysis to a particular set of relationships and activities within a domain, while keeping within the overall spirit of the original concept of community of practice.

Hara and many others, including Wenger, primarily apply community of practice theory to work-related learning outside of the academy. As noted earlier, this is fine for the purposes of this study since my intention is to reflect on learning as students work to become successful as students, and with respect to how this can improve learning within higher education. Work-related learning, which generally means related to the work graduates will engage in after they have completed their degree and as a professional in their chosen field, is already being incorporated into the curriculum in higher education. This is accomplished in many ways, for example, through problem based learning, internships, externships, and to a lesser extent by simulation and role play. However, in the case of the research presented here, the role of being a
student is also the work of the student, and the student is engaged in the practice of becoming and being successful in that practice.

One of the conflicts between the early use of community of practice by Lave and Wenger and the eventual adoption of community of practice as an organizational development tool is that communities of practice were originally described as spontaneous and informal in their genesis. In other words, a community of practice cannot be mandated into existence by an organization with the expectation that doing so will help facilitate learning by the workers in that organization, or, as in this case, among students in a graduate program. In many respects, the natural development of a community of practice happens because people who are working toward a similar goal, within a particular socio-cultural system, and who share the understanding of a similar or same set of tools and methods, gather together in a way that provides access to expertise and support for collaboratively resolving problems. It is an active community that grows out of a need that is not adequately fulfilled elsewhere. For example, Julian Orr’s ethnographic research on copy machine technicians and their work found that technicians were insufficiently supported by their organization in terms of adequate resources and training. The more the parent company tried to deskill their work, the more the technicians needed to look to their peers for help in resolving problems, in effect spontaneously creating their own community of practice (see Orr, 1996).

As a community develops, and as new members begin to participate, “both novice and experienced members…may interact with each other, share their experiences, and learn from each other” (Hara, 2009, p. 118). As a community of practice becomes established, the regular cycles of novices becoming experts form the generations of the community. Continuous
exchange and co-creation of knowledge across generations helps maintain the shared history and understanding of the practice over time (Wenger, 1998).

**Situated learning and legitimate peripheral participation.** So far I have presented a mile-high look at communities of practice, what they share in terms of a few key characteristics, and how easily they can be redefined to focus an analysis on a given set of participants actively engaged in practice within a particular domain. Returning to learning, for Lave and Wenger (1991), learning is a situated activity that has as its “central defining characteristic a process [that they call] legitimate peripheral participation” (p. 29). It is critical to note here that legitimate peripheral participation is not an educational method, a pedagogical strategy, or a recommendation for how to teach (Lave & Wenger, 1991; John Seely Brown & Paul Duguid, 1991).

Lave and Wenger coined the phrase legitimate peripheral participation (LPP) as a way to speak about the relations between novices and “old-timers, and about activities, identities, and artifacts and communities of knowledge and practice” (1991, p. 29). John Seely Brown and Paul Duguid (1991) described this as the novice’s acquisition of “that particular community’s subjective viewpoint” (p. 48). This is, at its heart, the process of novices becoming experienced members of the community of practice (Brown & Duguid, 1991, p. 29).

LPP as a concept descriptor is not to be deconstructed into its individual component words (i.e., legitimate, peripheral, and participant), nor is it to be used to create antonyms or other oppositional binaries such as “illegitimate peripheral participation” or “legitimate central participation” (Lave & Wenger, 1991, p. 35). It is intended, rather, for use in its entirety to describe the process of “engagement in a social practice that entails learning as an integral constituent” (Lave & Wenger, 1991, p. 35). Their argument, and use of LPP rather than simply
“situated learning” as a concept, is an important reconceptualization in order that their model not be misconstrued as one where either social processes or cognitive processes are primary. More concretely, it describes the movement of a new participant from a role of novice through the various iterative stages of acquiring the language and lingo, understanding behavioral expectations, obtaining acceptance and enculturation into the community and finally, the requisite level of expertise to share as a full participant. Brown and Duguid (1991) captured the spirit of incremental learning within community of practice this way: “the central issue in learning is becoming a practitioner not learning about practice” (p. 48). Lave and Wenger (1991) explained the importance of LPP thus:

Legitimacy of participation is crucial both for the naïve involvement to invite reflection on ongoing activity and for the newcomer’s occasional contributions to be taken into account. Insofar as this continual interaction of new perspectives is sanctioned, everyone’s participation is legitimately peripheral in some respect. In other words, everyone can to some degree be considered a ‘newcomer’ to the future of a changing community. (p. 117)

Wenger (1998) further clarified the idea that new participants to a community need to move beyond a stage of observation and become part of the community. He noted that “to open up a practice, peripheral participation must provide access to all three dimensions of practice: to mutual engagement with other members, to their actions and their negotiation of the enterprise, and to the repertoire in use” (p. 100).

LPP and the community of practice model have received considerable criticism for not addressing what happens when an experienced, but new participant joins a community of practice and how LPP might address this. Lave and Wenger’s lack of extensive discussion on this matter is not a drawback to their theory as presented in their 1991 work. In later adaptations of the model, Wenger (1998, 2003) and others (see Yrjö Engeström, 2004; Nick Jewson, 2007;
Francois Grima & Emmanuel Josserand, 2011) acknowledged that boundary crossing among communities of practice is necessary to prevent stagnation and to promote innovation. Indeed, inclusion of knowledgeable outsiders, or more generically any adaptation to a perturbance, is fairly standard with respect to the importance of diversity and catalysts for change in any complex system and I would expect community of practice to behave like the complex systems they really are.

**Temporal aspects of communities of practice.** The temporal dimension of community of practice is one that deserves particular attention when considering how graduate student communities of practice can develop and sustain themselves over time. Lave and Wenger (1991) briefly discussed, rather confusingly, the analysis of the reproduction cycles of community of practice as a way to delineate “the community that is the site of a learning process” (p. 99). At first they explained that the expected cycle or length of time that it takes a novice to become a full participant in a community represents the complete reproduction of the practice. They acknowledged that this oversimplification of the reproduction cycle ignores transformations in the community or in the practice itself. This sort of temporal analysis is a good start, however, in thinking about the places in time, for example, when learning happens based on differences in relationships. This becomes clear when you consider what happens when individuals move from one community of practice to another and how their learning is applied differently.

To illustrate this difference, the example that Lave and Wenger used is of high school students learning physics. When in high school, the students are not learning as part of the community of practice of adult physicists, rather “the actual reproducing community of practice, within which schoolchildren learn about physics, is not the community of physicists but the community of schooled adults” (pp. 99-100). Citing Traweek (1988), Lave and Wenger noted
that the actual reproduction cycles of the physicists’ community of practice starts “much later, possibly only in graduate school” (p. 100).

It is important to make distinctions regarding what the different communities of practice might be for students, and at what stage(s) they might enter a community of practice for their chosen professions. If secondary education, two-year trade schools, pre-apprentice college programs, 4-year undergraduate programs, or graduate programs are loosely defined as their own communities of practice, then the practice the students are learning is actually that of being students within that level of education rather than the professional practice of their intended careers. Integrating work-related learning such as practical experiences, internships, and service learning into traditional curricula are good strategies for preparing students for joining a professional community of practice outside of school. What Lave and Wenger’s theory teaches is that there is a social context within which the work is embedded, and a crucial part of learning that work is dependent on learning it from within — and more importantly, through — that social context. Work-related learning helps provide authentic social context for the professional work for which students are preparing. As Carol Costley (2011) wrote:

the construction of knowledge outside the university means that learning takes place in a way that is associated more with self-direction of learning than being formally taught by teachers. Workplace learning is generated, controlled and used within a community of practice and brings new understanding to pedagogical principles as the role of the worker becomes that of learner. (p. 403)

The research presented here, however, is about looking at the space between when a student enters a graduate program and when she or he graduates and leaves. The social context is thus bounded by an academic program that is the most common factor among all students participating, and within which their shared practice is that of becoming and being successful graduate students. The graduate program is effectively the workplace of the student.
Students who complete graduate programs generally do so within a certain number of years, depending on the discipline. The reproduction cycle is thus generated as students move into, through, and out of a program. If a community of practice develops among the students in a specific program, its generations are more or less defined by these cycles. Unless there are sustained, meaningful interactions and relationships across generations, then the knowledge created by the community cannot be retained by the community over time.

The field of knowledge management (KM) provides an excellent example of where knowledge is retained and what happens over time. KM blossomed with the increase in access and affordability of information technology tools and solutions in the 1980s and 1990s. KM is still important for the retention of, and access to, information produced by organizations; however, what has been learned is that technology makes it easy to store information, but bits of data stored in databases is not the same as the knowledge itself. This is especially true of tacit knowledge. Knowledge is created, modified by, stored, and conveyed within and across communities of practice. Thus learning organizations, for example, understand the importance of not just nurturing community of practice in order to remain agile and innovative, but also the importance of retaining the participants in those communities of practice. Knowledge (sometimes referred to as institutional memory) is stored within the experienced members and the relationships they have with one another. When there is too much turnover of individuals within the organization, the cohesiveness and continuity of organizational knowledge in interrupted. Thought of another way, as the reproduction cycles of the community of practice become unstable, the learning that takes place within the community of practice becomes disrupted or fragmented.
Cross-generational or cross-cohort communication within a graduate program thus becomes especially important as the generations are what keep the community of practice alive over time. If a reproduction cycle is the time it generally takes for individuals, on average, to complete a program, then the times and places where students from different cohorts can gather, share stories, and exchange advice becomes critical if a community of practice is to form and then sustain itself across multiple generations. Students gain experience in being students as they make progress and “learn the ropes” within a given program, and the transfer, re-use, and adaptation of that knowledge over time benefits all students, particularly those just entering the program. Any disruption to the reproduction cycle, such as several years without admitting new students, or to the context of the work, such as fundamental changes to the structure of the program, would result in a knowledge gap. Stories and advice from more experienced students may no longer be relevant or current enough to benefit new students. If the community of practice isn’t able to adapt and create new knowledge, it will likely cease to exist, or at the very least become ineffective.

Identity, belonging, and communities of practice. Hara (2009) listed “the creation of opportunities for the development of professional socialization and identity” as one of two major functions of a community of practice, the other being the “social construction of knowledge” (p. 113). In her research, Hara found that in face-to-face communities of practice the development of a professional identity was most important, and further, that a “group’s sense of professional identity makes or breaks a community of practice” (p. 119). She further determined that use of listservs within a community did not contribute to the formation of identity although they can help “extend a sense of community” (p. 117). These distinctions in the effect of face-to-face interaction and communication mediated by technology are important to the research presented
here because the community under study uses a hybrid educational model that combines in-person and technology-mediated communications. The examples that follow, while seemingly far afield from the types of experiences students might have with one another, clearly illustrate differences in belonging versus being accepted, and in learning how to ask for help while at the same time navigating interpersonal relationships within a community. These are, in fact, experiences with which students might resonate.

Joel Iverson (2011) made an excellent distinction between identity and belonging in a community of practice. His point is that one can be a member of a community of practice, with the requisite qualifications to identify with the group, but can be excluded by the group and thus not belong (p. 44-45). Iverson used the example of Ben Kuroki (cited from Dugan & Stewart, 2002) to illustrate this divide. Kuroki was a Japanese-American who joined the Army after Pearl Harbor. He was repeatedly left out or shunned by his peers, but eventually managed to receive training as an air-gunner. Even with top qualifications as an air-gunner, no crew would accept him. It wasn’t until after he was finally included in a mission that he actually belonged (Iverson, 2011, pp. 44-45). This distinction is important not because of what it says about the individual, but rather because of what it says about the rest of the community. “Formal membership is only part of the belonging equation,” wrote Iverson, “belonging is about knowledge and repertoire, but also about the actions of others who are members of the group” (2011, p. 45). Community of practice members can empower or weaken an individual, including affecting how the individual sees himself or herself, by supporting or excluding the individual from the community. While affiliation with a community of practice can help form an individual’s identity, Arthur Langer (2010) noted that identities can also be collective and that “it is through common membership that a collective identity can emerge” (p. 93).
Entrée into a community of practice is not always seamless and, given the social nature of communities, may involve difficulties based on bias, as seen with the Kuroki story, or can involve simple to complex rites of passage ranging from teasing to hazing. Lave and Wenger’s LPP implies that the novice’s presence in the community is based on some level of prior acceptance, at least on a conditional basis such as an apprentice being accepted by a mentor, but this does not automatically exclude the issues raised above. Charles Darrah (1996), having studied novice machine operators and their experiences entering a community of practice on the shop floor, described these difficulties with respect to requesting help.

As their tenure on the production floor lengthened, operators learned how to request assistance, thereby entering a world of mutual obligations. Operators differed in their reputations for offering and receiving assistance, and an important task for the rookie operator was to nurture a network of helpers. In some areas, rookies were subjected to practical jokes, such as instructions to retrieve nonexistent tools like the legendary “left-handed wire stretcher.” Operators accepted this hazing, since they relied on some of the culprits for help. Furthermore, unless the perpetrators were fired, the rookie feared creating enemies and developing a reputation as someone who “can’t take it” (Darrah, 1996, p. 126).

As can be seen from Darrah’s example, the rookie is concerned with his identity within the community as well as the need to belong, and in Iverson’s example, identity is associated with common membership and belonging is dependent on the group’s acceptance. In each case, the novices or new members of the community are building relationships with existing members, and in so doing are learning who to trust and establishing their own trustworthiness. Wenger (2000) might classify this as a deepening of social capital, where
people must know each other well enough to know how to interact productively and who to call for help or advice. They must trust each other, not just personally, but also in their ability to contribute to the enterprise of the community… (p. 230)

**Storytelling and community of practice.** Stories help community members relate information about typical and extraordinary work experiences and clever ways in which the problems were solved or not. Stories also help establish trust and credibility among members of the community, and help novices as well as experienced-but-new-to-the-community members learn the language and lingo, behavior patterns, and expectations of that community. Deborah Sole and Daniel Grey Wilson (2002) listed several ways in which storytelling benefits organizations: as a means to share norms and values; develop trust and commitment; share tacit knowledge; facilitate unlearning; and generate emotional connections (pp. 3-4). Stories can also help establish connections between different communities of practice as members move from one to another.

Hara (2009) discussed research from Orr (1990, 1996) and Zuboff (1998) that revealed the importance of storytelling in a community of practice. According to Hara, both Orr’s and Zuboff’s studies demonstrated that storytelling is fundamental to fostering knowledge among people because it helps to develop a shared understanding. As Sole and Wilson (2002) noted, storytelling is a communication form that synthesizes rather than analyzes information (p. 1). In addition, it provides a situated context and is appealing because of its improvisational nature. Storytelling is also a tool for the conversion of tacit knowledge to explicit knowledge (Hara, 2009, p. 11).

Darrah’s (1996) study of machine operators revealed that as novices become more familiar with their machines, they are able to attend more closely to the “larger lessons about the production floor, [which] are conveyed in stories and conversations” (p. 125). John Seely Brown,
Allan Collins, and Paul Duguid (1989) recommended that storytelling be permitted and even encouraged because “within a culture, ideas are exchanged and modified and belief systems developed and appropriated through conversation and narratives, so these must be promoted, not inhibited” (p. 40). They felt that “learning environments must allow narratives to circulate and ‘war stories’ to be added to the collective wisdom of the community” (p. 40). This is true also of graduate education: there needs to be spaciousness in the structure of the program to allow for students to engage with one another long enough to build trust and communication patterns that allow those stories to circulate.

Storytelling may also be a way for newcomers, particularly those who are not also novices, to establish connections and credibility when first entering a community of practice. Certainly the sharing of war stories by experienced but new members demonstrates both the level of commonality they have with the existing membership, and also allows for new information and knowledge to be shared. Stories about relationships or other commonly held human connections also have the effect of establishing a form of professional kinship across different community of practice. In our recent research on feminist collaboration in higher education, Marna Hauk and I found that some collaborative scholars find “academic cousins” among others who share a sort of academic genealogy via their dissertation advisors’ mentor-protégé relationships (Hauk & deChambeau, 2011). This human relationship network helps establish a connection before any collaboration even occurs.

**Communities of Practice Applied to Higher Education**

Within higher education there exists a relatively small body of research that very deliberately applies community of practice in different ways to describe or to encourage student success at the graduate level. For the purposes of this review, I am speaking of research that uses
a strict definition of community of practice specifically as described by Lave & Wenger (1991) or Wenger (1998). A carefully narrowed search was conducted across the education and business literature to identify articles that expressly used the phrase “community of practice,” that referred to the relevant early works of Wenger (1998) or Lave and Wenger (1991), and that focused their case on graduate education at the master’s or doctoral level.

This narrow approach was necessary because the objective of this analysis was to focus on the application of the community of practice theory developed by Lave and Wenger to graduate education. This hyper-focus was also essential for excluding the numerous publications addressing learning communities, professional learning communities, communities of inquiry, networks of practice, and other related communities developed and deployed in higher education. This is not to say that those communities and community structures are less valuable or authentic as learning incubators, only that my interest and that of my research presented in this dissertation is concentrated on the application of Lave and Wenger’s theory.

Roles of communities of practice in graduate education. Graduate study is markedly different from the undergraduate experience. It is often described as isolating and lonely work (Annick Janson, Laurie Howard, & Michèle Schoenberger-Orgad, 2004; Jane Tobbell, Victoria O’Donnell, & Maria Zammit, 2010). Graduate students, in general, are also distinctive from the traditional undergraduate in that they are in a different phase in their lives and have professional and personal obligations that, in general, most undergraduates do not yet share. Yet relatively little attention is paid in the research literature to the success of graduate students. Jane Tobbell, Victoria O’Donnell, and Maria Zammit (2010) addressed this relative silence in the literature through their own research on educational transition, and found that graduate students might be considered ‘expert’ students already, and their success as undergraduates and subsequent
continuation within academe implies that there is nothing else they must learn about being a student (p. 262). In other words, it is assumed that they are already equipped to succeed as students.

Community has a fundamental role to play in graduate education not only for intellectual and academic support, but also personal and emotional support. It is especially useful for mitigating feelings of isolation. The use of cohort models in higher education, for example, is popular as a construct for facilitating community among students admitted to a program in the same intake year (Elizabeth Tisdell et al, 2004). Learning communities are similarly popular, reinforcing the fact that community is a contributing factor to student persistence and success at all levels of higher education.

It is important at this point to pause and differentiate between communities of practice and the learning communities that are generally associated with specifically designed academic programs, primarily for undergraduates who enter college as a cohort and are associated in a community based on shared coursework, a core academic focus, residential housing arrangements or other organizing factors. As Barbara Leigh Smith (2001) described them, these types of learning communities involve a “purposeful restructuring of the curriculum by linking or clustering courses that enroll a common cohort of students. …an intentional structuring of the students [sic] time, credit, and learning experiences to build community, and foster more explicit connections among students, faculty, and disciplines” (see also Faith Gabelnick, Jean MacGregor, Roberts S. Mathews, and Barbara Leigh Smith, 1990).

Learning community is sometimes used in a slightly different context more closely associated with communities of practice, and is defined and discussed at length by Wenger in his 1998 book Communities of Practice. Learning communities in this sense are communities of
practice that are able to maintain a productive tension and “fine tuning,” as Wenger described it, between experience and competence; a community that is able to maintain this tension in a positive manner holds learning at its very heart (1998, p. 215). Learning communities in this respect not only make acquisition of knowledge available and possible for newcomers to the community, but also actively create knowledge for the advancement of the community (Wenger, 1998, p. 214). They are, in other words, communities that actively and deliberately continue to learn.

Another, perhaps more appropriate term for much of what the following review reveals is learners’ community, which is described by France Henri and Béatrice Pudelko (2003) as a community that is created by an instructor to scaffold collaborative learning through participation and reification (p. 481). Learners’ communities are different from communities of practice in that they are instructor-led, tied to specific educational objectives of an institutional program, and generally do not live beyond the completion of the course or program. Several of the cases described here either use the community of practice theory as a learning strategy or they endeavor to foster a community of practice in their courses or programs, but the result is something closer to a learners’ community; an effective, and possibly even more appropriate, level of community for a course or an academic program to foster given temporal constraints.

One of the conflicts between the early use of community of practice as described by Lave and Wenger, and the eventual adoption of community of practice as an organizational development tool, is that communities of practice were partially defined by the spontaneous and informal nature of their genesis. They are voluntary communities (Wenger, McDermott, & Snyder, 2002). In other words, they cannot be mandated into existence by an organization or institution with the expectation that it helps facilitate learning by the workers in that organization
or students within an academic program. In many respects, the natural development of a community of practice happens because people who are working toward a similar goal, within a particular socio-cultural system, and who share the understanding of a similar or same set of tools and methods, gather together in a way that provides access to expertise and support for collaboratively resolving problems. It is an active community that grows out of a need not adequately fulfilled elsewhere.

This organic growth is thus one of the characteristics of community of practice that makes them difficult to fully replicate as an educational strategy or learning management system. In fact, as Wenger and Snyder (2000) described it, the “organic, spontaneous, and informal nature of communities of practice [is a characteristic that] makes them resistant to supervision and interference” (p. 140). It can be, however, the way that instructional teams come together to develop and support new or improved academic programs, and to support and learn from one another within that professional endeavor. Alternatively, students may also come together organically to support one another academically and emotionally as they navigate their way through a shared academic program. Although Wenger (1998) cautioned that communities of practice are not a new pedagogical structure (p. 228), a community of practice can provide a rich and adaptable structure for developing a supportive learning environment or learning management strategy (Mary Jo Dondlinger & James Jones, 2008; Catherine Monaghan & Norina Columbaro, 2009). It is also useful as a framework for analyzing or reflecting on existing programs, providing insights into the different types of support graduate students require (Janson, Howard, & Schoenberger-Orgad, 2007; Juliet Willetts & Cynthia Mitchell, 2006). In either case—as a development or an analysis tool—community of practice theory can provide
structure that helps educators in understanding, fostering, and contributing to graduate student success.

A very narrow search of the education literature for research in graduate education that specifically used Lave and Wenger’s community of practice model yielded few results. Of 21 papers found, only 16 were substantially relevant. Some lacked the depth of treatment or priority of community of practice for the bulk of the article (see Anita Ens, Karen Boyd, Allyson Matczuk, & Warren Nickerson 2011; Rausch & Crawford, 2012), or did not sufficiently or meaningfully reference either Lave & Wenger (1991) or Wenger (1998) (see Miri Shacham & Yehudit Od-Cohen, 2009; Felicity Wikeley & Yolande Muschamp, 2004). One paper was deemed irrelevant because the community of practice upon which the research was conducted was superficially assumed to exist simply because the students were enrolled in the same academic program, took common courses together, and were physically co-located in a department (see Zeying Wan, Yulin Fang, & Derrick Neufeld, 2001). The following section of this review is thus restricted to the remaining 16 papers, reporting on a total of 15 unique graduate programs; one program had two papers reporting.

There are three ways the articles reviewed here chose to define or describe a community of practice so that it was recognizable within the context of their research. The majority of articles used Wenger’s 1998 dimensions of practice as distinguishable properties of a community: mutual engagement, joint enterprise, and shared repertoire (Wenger, 1998, p. 73). The second most popular method for identifying a community of practice used stages of development or specific characteristics. Stages of community of practice development, such as from Wenger’s 1998 model, include phases such as recognizing potential, coalescing, maturing, and experiencing stewardship. Characteristics of a community of practice, on the other hand,
show that the community of practice is self-forming and self-governing; members share a common interest or passion; members are involved in the creation of new knowledge; learning occurs in a real-time content; community of practice can occur any time during a person’s life; a community of practice facilitates development of shared meaning and identity formation (Wenger, 1998; Wenger, McDermott, & Snyder, 2002). Lastly, a few of the papers focused primarily on the aspects of a community of practice which concern social learning, situated learning, and the social theory of learning.

In this comparison of the research literature, five themes emerged with respect to the way in which community of practice theory was applied or addressed by the studies’ authors. Several papers could be categorized using more than a one theme, but for the purposes of analysis they are considered within the theme they most predominantly exhibit. Themes that emerged include:

1. Community of practice applied as a framework for analysis
2. Community of practice applied within a reflection of an experience
3. Community of practice addressed as an intentional learning strategy
4. Research situated within the context of developing a community of practice
5. Research situated within the context of memberships in multiple communities of practice

Figure 1 provides a conceptual outline of the discussion of themes that follows. It highlights the main points from the literature within each theme, linking them visually to the authors’ whose research is reviewed and briefly discussed. The primary focus is on how the community of practice concept is applied in graduate education, and how that application relates to or results in student success.
Figure 1. Concept map linking reviewed literature to categories of community of practice theory applied in graduate education, and also to the indicators of how those applications contribute to student success.
Discussion of Themes

Community of practice as a framework for analysis. Articles applying community of practice as a way to methodically analyze a graduate program generally outlined characteristics of a community of practice as a logical set of criteria, and then discussed data in terms of how well the program fit or demonstrated those characteristics. In some cases, the program might have originally been developed using community of practice as a framework, and the analysis of the program outcomes was done within that same framework. For example, Erin Crede, Maura Borrego, and Lisa McNair (2010) discussed the long-term preparation of engineering graduate students for academic careers as faculty. Community of practice theory informed their program design, and students were deliberately managed in terms of a trajectory from novice academic to junior colleague as they progressed through a graduate teaching fellow program. The analysis was presented using structure borrowed from community of practice theory, which Crede, Borrego, and McNair (2010) found added additional depth to the program (p. 18). Relationships between students and faculty were strengthened, and the experience for the students extended beyond increased teaching responsibilities to a better understanding of how to balance research and teaching in an academic career. When community of practice theory informs the development of a program at the outset, then measurements for outcomes can automatically be included.

In other cases, community of practice theory was used as a framework for describing and discussing what happened within, or across, different groups that already existed in a specific academic program. Ana-Paula Correia and Niki Davis (2008) combined Lave and Wenger’s community of practice theory with a typology of communities created by Henri and Pudelko (2003) to form an analysis framework for studying the changes within learning ecologies (p.
Correia and Davis’ ecological perspective looked at levels of adaptation across different nested academic structures; for example, the classroom ecology sits within the department ecology and so forth. In their 2008 analysis, Correia and Davis used a community of practice framework to describe the ecologies of the project team (including instructors and designers) and the student cohorts. One of their findings showed that it was effective and appropriate for a program team to organize as a community of practice, and that when doing so the team should pay attention to the temporal aspects of peripheral participation and allow enough time for new members to become sufficiently enculturated to operate most effectively as contributing members. They also found that student cohorts can divide themselves and develop into different types of communities, where one portion might operate more as a community of practice and another more as a community of learners. Using community of practice characteristics to describe and explain various ecologies operating simultaneously allowed them to illustrate along a continuum of community maturation where and how points of disruption effected changes in those ecologies relative to each other.

Similarly, through observation of the behavior of student cohorts in a doctoral program, Shosh Leshem (2007) determined that there was an undervalued community of practice aspect to the program that could be nurtured to better benefit the students. Specifically she found that participation in a community of practice was useful for doctoral candidates’ “conceptual appreciations of their topic… [and that for] them, conceptualization posed no hindrance,” whereas for others the development of a conceptual framework for their research and thesis was especially difficult (2007, p. 296). Leshem made a good argument using community of practice theory and its characteristics to describe how the doctoral students she observed are engaging in “mutually beneficial activities while recognizing learning as a shared endeavor” (p. 295).
However, given the temporal constraints of the community she described, I would classify them as learners’ communities rather than long-lived communities of practice. In either case, Leshem found that engagement in community increased higher-order thinking, and helped students fulfill the particularly difficult academic task of developing their conceptual framework, thus demonstrating what she refers to as their “doctorateness” (p. 297)

Rosemary Green (2006) used the theoretical community of practice framework to present and discuss the instructional environment created to support a community of graduate learners in an online information literacy course. Following a curricular redesign, courses included elements specifically intended to facilitate community participation (p. 170). Core content courses, offered in a face-to-face setting, were combined with co-requisite skills courses offered online. Students and instructors shared membership in the courses as well as in individual cohorts. A learning community was assumed, with mentoring and coaching from the instructors, who used a guided practice approach in posing questions and offering feedback (p. 177). Green outlined the educational design and mapped the students’ experiences using the community of practice framework, but rather weakly concluded her analysis by indicating that a community of practice might or might not develop, depending on the dynamics of the group. Her paper is a good example, though, of how an analysis of a learning community can be neatly organized by applying a community of practice framework, even if the ultimate goal of the course or program design results in a learning community and not a fully formed community of practice.

When used as a framework for analysis, community of practice theory can help guide and provide structure for breaking apart and describing what happens within a community, and to what level it has developed along each characteristic. In each case outlined above, the definition of community of practice was based at minimum on the concept of a group of people with a
shared interest who were engaged in mutual learning and knowledge sharing, and who used a shared repertoire of resources (Correia & Davis, 2008; Crede, Borrego, & McNair, 2010; Leshem, 2007; Wenger, 2007, 1998). Crede, Borrego, and McNair discussed their community of practice in terms of a longer time frame, as did Correia and Davis when addressing a community of practice for the program team. The student groups discussed by Leshem, and by Correia and Davis, while meeting the most basic criteria for qualification as a community of practice, also lacked a true reproduction cycle and thus are better categorized as learners’ communities.

Using community of practice as a framework for analysis allows researchers to look for ways in which community—whether a community of practice or a learners’ community—contributes to student success. As Leshem (2007) found, learning through participation facilitates higher order thinking, and verbalizing thoughts helps with understanding and contributes to students’ confident use of concepts (p. 279). Green’s (2006) research with educational leadership students working in a learning community demonstrated that individuals share professional experiences, which are combined with course-acquired knowledge and filtered by the group “through peer-sharing, advice and feedback” (p. 179). Working together in this way closely parallels the concept of community of practice members’ trajectories, along which “novices grow into competent participants, learning with and from each other. At times, the boundaries blur, and all participants act interchangeably as learners and teachers” (Green, 2006, p. 180).

Significant gains in confidence were also described by Crede, Borrego, and McNair (2010), who found that increased confidence coincided with the student’s development of an identity within the profession. Experience learning within a community of practice, combined with increased confidence and a deepened identity as a member of a profession, also reduces the time students
need to transition into new professional academic communities (Crede, Borrego, & McNair, 2010).

**Community of practice as a framework for reflection.** Reflective articles use community of practice as the framework for reflecting on the experiences in a graduate program. This differs from community of practice as a framework for analysis in that these reflections are primarily student-initiated and their formation into a community of practice was not institutionally facilitated as part of the graduate program. Leshem’s (2007) analysis outlined above is based partly on reflection with an intention to improve the doctoral student experience by enhancing the program. Annick Janson, Laurie Howard, and Michèle Schoenberger-Orgad (2007), on the other hand, began with reflections on their experience as graduate students and discovered that they had organically established a community of practice. They described how their experience mostly followed an unpublished 1999 model of Wenger’s that flows through the stages of recognizing potential, coalescing, maturing, and reaching a level of stewardship. To these stages Janson, Howard, and Schoenberger-Orgad (2007) added a pre-potential stage they called the critical point (p. 169). For them, there came a critical point in their shared academic experience where negatives could have outweighed positives, and students could have succumbed to overwhelming feelings of isolation, possibly leaving the program. Instead they formed a community where they could share their experiences and, at the same time, help one another combat their isolation (pp. 173-174). As they noted in their conclusion, the relevance of communities of practice for students is that they “can attend to experiences of process and feeling as well as issues of content” and are thus important for supporting students emotionally as well as academically (p. 179). Faculty can indicate to students that a loose network exists and
nudge them into cultivating their own community, but the students need to take ownership of the process and direct it in ways that they find to be most beneficial for them.

Similarly, Juliet Willetts and Cynthia Mitchell (2006) used community of practice theory to reflect on their doctoral (i.e., postgraduate) program. In their case, they explicitly set out to use the community of practice model as “a [critical] lens for reflecting on [their] evolving transdisciplinary postgraduate program” (p. 398). Their program grew organically and they wanted a theoretical frame to guide further development. Based on a recommendation by Pearson and Brew (2002) (as cited in Willetts and Mitchell, 2006) that a community of practice model can be useful for conceptualizing research communities, Willetts and Mitchell reflected specifically on their practice in terms of mutual engagement, joint enterprise, and shared repertoire (p. 340). They concluded their reflection by identifying additional opportunities for future design and direction of their community based on Wenger’s infrastructures of learning: engagement, imagination, and alignment. These opportunities included ensuring that the community remains current, facilitating continuity and ways to engage across cohorts, and pushing boundaries and “[locating their] own meanings within a larger context” (p. 404).

When used as a framework for reflection, community of practice theory and structure help provide the researcher with ideas of what to look for in their community to determine if it is functioning as a community of practice. Critical reflection based on the community of practice model, combined with other learning design ideas, can result in actionable activities that communities can engage in to further the learning of its members as well as its community-self. And finally, as Willetts and Mitchell concluded, using the community of practice model to reflect allowed them to coherently describe important elements of their program “…such that the ideas may be transferred to other settings” (p. 404).
In terms of student success, using community of practice as a tool for reflecting can help identify important parts of a program that need development, or that are working particularly well and might be duplicated elsewhere. With respect to program completion as an indicator of success, Willetts and Mitchell (2006) and Janson, Howard, and Schoenberger-Orgad (2007) found that participating in a community encouraged student persistence in a program. Janson, Howard, and Schoenberger-Orgad specifically noted that participation in a community of practice helped students overcome critical points that might otherwise have caused them to leave the program. Both studies found that community of practice participation reduced the sense of isolation and feelings of doubt that many students experience, with critique and feedback from peers helping to provide validation for individuals. Further, as Willetts and Mitchell pointed out, the social contact also helped motivate students to get things done, especially when students created an “accountability regime” for mutual support and sharing (p. 402). With respect to learning, in reflecting on their program using community of practice as a framework, Janson, Howard, and Schoenberger-Orgad (2007) found that students working together were co-constructing knowledge about both the topics and the processes involved with being a student and surviving the experience. Similarly, Willetts and Mitchell found that challenges in the discourse helped shape practice and deepen meaning for the students in their program. Further, their reflection, which was on a transdisciplinary program, indicated that participation in transdisciplinary community helped students broaden their perspectives and “…achieve integration across disciplines meaningfully” (p. 404).

Community of practice as a learning strategy. Several articles discuss research that deliberately applies and deploys community of practice as an explicit strategy for enhancing learning in a graduate program or coursework. This includes acknowledging that engaging in
class as a community of practice is an artificial construct (given that communities of practice usually develop organically), but allows students to learn about a community of practice, as well as how to behave within it as part of the entire learning process. Catherine Monaghan implemented one of the most interesting applications of community of practice as a learning strategy in her graduate course on Human Resource and Organizational Development. She created a community of practice classroom environment as both an assignment and as a learning strategy, and encouraged students to share expertise, develop self-directedness in their learning, promote critical thinking, and foster continuing professional development (Monaghan, 2011, p. 429). In this case, the organic growth of a community of practice is explicitly acknowledged; the students understand that they were learning about a community of practice within an artificial construct, while at the same time they were encouraged to continue to develop the community. Students were instructed that although the nature of the community of practice in the class setting is artificial, it still provided for them “an approximate experience where they can learn to be more self-directed and collaborative” (Catherine Monaghan & Norina Columbaro, 2009, p. 422). This allowed students to engage with the course content as well as the community of practice model, learning about human resource and organizational development and about how to participate as a member of a community of practice. In other words, they engaged deeply with a course related topic, they developed as collaborative, self-directed learners, and they “[solidified] their sense of belonging and identities as members of a profession and an organization” (Monaghan, 2011, p. 447).

Gina Wisker, Gillian Robinson, and Miri Shacham (2007) reported on action research into communities of practice for graduate student cohorts and for postgraduate supervisors (i.e., doctoral supervisors). In this case, the researchers made the argument that not only might
graduate students feel isolated, but the postgraduate supervisors might also, particularly in an international program where students and supervisors are at a distance from one another. In addition to isolation, this research also addressed issues of distance and diversity in the program. There were three interacting communities of practice that were in a continual state of development and improvement, as per the action research model. The Ph.D. cohorts functioned as communities of practice where students learned together and supported each other outside of the workshops. The guardian supervisors and distance supervisors also had their own community of practice, and worked together to continue to learn and develop the relevant skills, values, and shared resources that supported their work and growth. This particular example overlapped with development of community of practice as thematically presented in this review, but the action research nature of the program, with its continued development of the community of practice through full participation and collaboration by students and supervisors, placed it squarely in the realm of learning strategy. Further, in this case, the learning was uniquely enhanced for the supervisors as well as the students, and as “each community of practice [interacted] with the others, [it lead to] ongoing developmental learning and [made a] substantial contribution to the life and success of its members” (Wisker, Robinson, & Shacham, 2007, p. 318).

Another approach to incorporating community of practice as a learning strategy is to mimic one within the program as well as require students (i.e., peripheral participants) to reach out to the wider, professional community of practice in the form of structured interactions with faculty experienced in the field (i.e., expert members). In an early report on the design and development of a rubric-driven online portfolio system, Mary Jo Dondlinger and James Jones (2008) included community of practice and situated learning theory in their description of the theoretical basis of this system. Both the design of the system and the submission of portfolio
items into the system are intended to situate students within an educational computing community of practice. The rubric development was delegated to the students, situating them within the contextually authentic requirements for design in educational computing, as well as fulfillment of the portfolio requirements of the doctoral program. The actual use of the online portfolio system facilitated mutual engagement of students and faculty as a community: faculty communicated the values and standards of the educational technology practice community while students were actively mentored from their positions as peripheral participants to more experienced members of the community (Dondlinger & Jones, 2008, p. 28).

When a community of practice is implemented as a learning strategy it can have many beneficial effects on student learning, as well as personal and professional development. For example, Dondlinger and Jones (2008) found that the use of community of practice as a learning strategy increased students’ satisfaction with their learning experience and improved their performance in educational research. Students produced higher quality artifacts and were better prepared for their doctoral defense. Participating in a structured community of practice scenario offered a real-life context for students’ work, while at the same time supporting them incrementally, as might happen in a professional community of practice.

In addition to mentoring and critical, supportive feedback on student work, and as shown in previous examples, engagement in community helps reduce feelings of isolation, increase self-esteem, and enhance self-confidence. When students learn and use a common language for working together, it can be beneficial when students come from different academic and professional backgrounds. Students feel empowered “to develop mutual, critically focused support for each other’s work” (Wisker, Robinson, & Shacham, 2007, p. 301) and are able to
increase their research capacities, increase higher-order thinking skills, and “make action plans for the future” (Wisker, Robinson, & Shacham, 2007, p. 317).

Monaghan’s work integrated community of practice theory into the design of her courses and the overall learning strategy for the students. As such, her approach was oriented directly toward student learning and success. Her findings indicated that modeling a community of practice in her classes created more opportunities for educating and learning, and contributed to the student’s desire for lifelong learning. Her research found that community of practice theory provided a strategy for promoting self-directed learning and collaboration simultaneously (Monaghan & Columbaro, 2009) and it encouraged transfer of learning to the professional environment (Monaghan, 2011). Monaghan’s courses were specifically about human resource development and organizational learning, and by using community of practice to structure the student experience it exposed them to the professional development environment that they were likely to encounter in the workplace, and thus better prepared them for their professional careers.

The use of community of practice theory as a learning strategy generally involves students, or faculty if they are also learning, as critically aware of the community of practice structure in which they are participating. Students not only learn content, but also learn to support one another. In addition, they experience a community of practice in action, and become aware of what it is like to participate professionally within a community of practice.

Development of community of practice. Graduate programs might also foster the development of a community of practice. In the examples above, the research by Wisker, Robinson, and Shacham (2007) included elements of supervisors actively encouraging dialog and engagement of students in their community of practice, while the reflective research by
Janson, Howard, and Schoenberger-Orgad began with a faculty member bringing the students together so they could support one another.

The literature reported in different ways about how programs foster the development of a community of practice in a graduate program or series of courses. This includes instances where instructional staff encourages the development of community of practice within the program or courses through tactics such as implementing a cohort model, conducting seminars and meetings, and actively engaging students in online discussion boards or in face-to-face dialog. Krish Govender and Rubby Dhunpath (2011) looked at the effect of running concurrent cohort seminar sessions with the traditional one-to-one master-apprentice student supervision model to determine if support for students could be maximized (p. 89). Community of practice theory was followed for the creation of the cohort sessions and the support they provided for students. Seminar sessions were planned to bring students and novice cohort supervisors together six weekends per year for three years. Student thus benefitted from an apprentice-master relationship with their supervisor, as well as from peer support and access to additional experienced and novice supervisors from the faculty as part of their cohort sessions (Govender & Dhunpath, p. 89). One of their findings related that, when trying to facilitate the growth of a community of practice, a program must be prepared to handle conflict, should it develop, and use that as space for constructive conversations. Tensions might otherwise threaten the creation of a learning community or, ultimately, a community of practice (Govender & Dhunpath, p. 96). Correia and Davis (2008) had a similar finding in their research, and recommended that rather than trying to eliminate conflict when working within a community of practice, programs try to embrace and manage it in ways that help build relationships and enhance learning (p. 304).
Joyce Lee, JoAnn Carter-Wells, Barbara Glaser, Karen Ivers, and Chris Street (2006) used community of practice theory as one of several models they drew from in conducting a study on the development of a learning community in an online graduate program. Their case study focused on what students found most effective as community-building approaches when developing a learning community. They discovered that “community-centered approaches to learning…[and the] establishment of a constructivist learning environment” were most essential in the formation of an e-learning community (Lee et al., 2006, p. 28). Of note from this study was that students found positive interactions with instructors, other students, and support staff to be important to the formation of community, but not to actual academic achievement. Students in this study confirmed what had been shown in previous example, that critical discourse enhanced “students’ capacities as critical thinkers…[and fosters] a knowledge-building community” (Lee et al., 2006, p. 29).

Research by Maria Ferreira (2010) took a different approach. She studied participation of men and women in two different scientific communities of practice: a chemistry department and a biology department. Her analysis clearly indicated that students begin to participate in the scientists’ community of practice through their early peripheral position as students. Collegiality and diversity were crucial to the integration of students into the culture of their department, and a departmental community of practice that lacked these traits lost the students who felt unwelcome or who did not have peers with sufficiently diverse backgrounds with whom they could interact easily. In fact, students who leave a department at this point in their academic career might leave the larger professional community of practice before ever becoming full participants (Ferreira, 2010, p. 16). Academic departments are essentially students’ entrée into the community of
practice of their discipline and can facilitate the inclusion or exclusion of students depending on how the departmental culture supports or discourages diversity and collegiality.

When possible, fostering the development of a community of practice within a program can contribute to student success in different ways. As seen repeatedly in earlier examples, membership in a community of practice increases students’ self-worth and efficacy and decreases the sense of isolation (Janson, Howard, & Schoenberger-Orgad, 2004; Lee et al., 2006). By providing more opportunities for meaningful discussion, fostering the development of a community of practice increases learning by challenging students to think critically (Lee et al., 2006, Shacham & Od-Cohen, 2009). Community involvement also increases individuals’ commitment to shared progress (Lee et al., 2006) and helps students pace themselves effectively (Govender & Dhunpath, 2011, p. 91), both of which can contribute to persistence in a program. One particularly unique finding of Govender and Dhunpath’s was that participation in a community of practice helped returning students adapt to new paradigms and delivery mechanisms for teaching and learning (2011, p. 91).

Ferreira’s (2010) research looked at the development of a community of practice from a different perspective, and showed that student success can be significantly affected by departmental culture. A department with a progressive and democratic community of practice culture creates a more collegial and diverse experience for the students, helping to retain them not only in a specific program but also within the profession. A departmental community of practice that is insular and lacks diversity can effectively force a student not only out of the program but influence them to choose an entirely different profession.

**Community of practice addressed within the context of multi-memberships.** The last theme that emerged from the articles applying community of practice theory to graduate
education addressed the effects of a student’s transitioning between communities of practice, such as between a professional community of practice and the community of practice of their academic program. Boundary crossing between communities is a characteristic sometimes present in communities of practice, and can have a positive or negative effect. Boundary crossing can inform the impact an instructional staff community of practice can have on a community of practice fostered for the students in the program (Govender & Dhunpath, 2011; Wisker, Robinson, & Shacham, 2007). In some cases, the community of practice might be the wider community of practice of “the academy,” or of a specific discipline or profession into which students are being enculturated. Students might need to negotiate between professional identities, personal life events, and shifts in learning identities to successfully complete their graduate studies (Crede, Borrego, & McNair, 2010; Tobbell, O’Donnell, & Zammit, 2010). In cases where the predominant disciplinary or departmental community of practice is closed or unwelcoming to students or diversity, students might be unable to make the transition into that community of practice and leave the program or even the entire profession (Ferreira, 2010). In instances where the predominant community of practice is welcoming, supportive, collegial, and encourages diversity for women and minorities, there might be better progression into the community of practice, and students might persist through graduation; the entire community of practice thus benefits from engaging with more progressive ideas and democratic attitudes (Ferreira, 2010).

Elizabeth Stacey, Peter Smith, and Karin Barty (2004) conducted research to determine if participation in an online graduate community of learning enhanced or interfered with their participation in a workplace community of practice. By structuring online learning communities to “establish the required dimensions of a community of practice as described by Wenger” and
mirroring as closely as possible an informally developed community of practice that learners may find in the workplace, there was little or no negative impact as learners experienced their multi-membership (p. 121)

Julie Mackey and Terry Evans (2011), on the other hand, looked at ways in which “individuals orchestrate their engagement with others to further their professional learning,” particularly as students participated across boundaries between online learning communities and professional practice (p. 1). Mackey and Evans argued that multi-membership in communities could be leveraged as connectivist pedagogy, and online courses developed to encourage students to “develop their own networks of practice within and beyond the course parameters” (2011, p. 13). Effectively done, courses can enable students to adapt their “learning activities to align with their own professional contexts” (Mackey & Evans, 2011, p. 14).

Transition research provides yet another perspective on the ways in which graduate students negotiate between and among professional and academic communities of practice. Jane Tobbell, Victoria O’Donnell, and Maria Zammit considered the academy itself to be the community of practice into which doctoral students are being enculturated, i.e. transitioned into the culture. Students’ identities are formed through membership and participation in many communities of practice. Transition can be “understood in terms of shifts in practice, within or between communities coupled with identity transformation and the ‘work’ of transition becomes the negotiation of those practices in light of past and present membership of other communities and present identity” (Tobbell, O’Donnell, & Zammit, 2010, p. 266). Identity shifts in personal and university practices are involved as adults transition to become successful graduate students (Tobbell, O’Donnell, & Zammit, 2010, p. 276).
For Tobbell, O’Donnell, and Zammit, then, success depended on “fundamental shifts in learning identity” and “negotiating these shifts in light of commitments and life events external to the study environment” (2010, p. 207). An important finding in their research was that when universities do not recognize students’ lives outside of the university, while at the same time emphasizing self-directedness, students might experience “identity shifts that do not facilitate learning” (Tobbell, O’Donnell, & Zammit, 2010, p. 277). Institutional support of student success thus depends on an institution fundamentally recognizing these external commitments and at least accounting for them when planning the student learning experience.

**Roles of Communities of Practice in Graduate Student Success**

This chapter began with a review of the literature associated most closely with the original concept of community of practice. Basic background information about the history of the term and the overall theory was introduced, with special attention to the key concepts of situated learning and legitimate peripheral participation. I have further introduced and discussed the literature relevant to the temporal dimension of a community of practice, which is measured in terms of the reproductive cycles or generations of a community. The importance of identity and belonging in a community of practice was discussed briefly, as was the significance of storytelling in building trust as well transmitting information within a community.

The literature review then took a very specific look at ways in which community of practice concepts have been applied in graduate education and outlined five themes that emerged: community of practice applied as a framework for analysis; applied within the reflection of an experience; addressed as an intentional learning strategy; situating research within the context of developing a community of practice; within the context of multi-...
memberships. The research within each theme was introduced and the relationship of their outcomes to student success was discussed.

When looking at the effects on student success across all five of these application themes there emerge three larger categories in which the community of practice plays a positive role. Specific evidence of success from the application of community of practice principles are gathered from the actual research results presented in the articles and not from their literature reviews. These emergent categories include: support and facilitation; internal drivers and affective attributes; and an impact on or increase in learning. Figure 2 relates these patterns to corresponding student success indicators, and each is briefly discussed in the following sections.

Figure 2. Three categories emerge—support and facilitation, internal drivers, and impact on learning—where student success is enhanced by the application of community of practice theory in graduate education. Evidence of impact in each category is displayed in this figure.

Support or facilitation of community of practice development. Institutional actions can facilitate the creation of a student community of practice, or support and nurture one that already exists. Institutional actions include the actions of faculty, instructional design teams, and
instructional support staff. A community of practice, an approximation of a community of practice, or even a learners’ community can provide structural support for students that can help them overcome obstacles, increase learning, and persist in a program through completion. From the literature reviewed, Table 2 identifies which research provided the evidence of support for student success within the facilitation of community of practice development category.

Table 2

*Evidence of Support and Facilitation of Community of Practice in Graduate Education*

<table>
<thead>
<tr>
<th>Support and facilitation</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constructed or structured CoP experiences</td>
<td>Correia &amp; Davis, 2008; Crede, Borrego, &amp; McNair, 2010; Dondlinger &amp; Jones, 2008; Govender &amp; Dhunpath, 2011; Green, 2006; Lee et al., 2006; Monaghan, 2011</td>
</tr>
<tr>
<td>Support along student trajectory</td>
<td>Crede, Borrego, &amp; McNair, 2010; Green, 2006; Monaghan, 2011; Tobbell, O’Donnell, &amp; Zammit, 2010</td>
</tr>
<tr>
<td>Structures to bring students together to form relationships</td>
<td>Correia &amp; Davis, 2008; Govender &amp; Dhunpath, 2011; Janson, Howard, &amp; Schoenberger-Orgad, 2007; Leshem, 2007; Monaghan, 2011; Stacey, Smith, &amp; Barty, 2004</td>
</tr>
<tr>
<td>Course strategy</td>
<td>Dondlinger &amp; Jones, 2008; Green, 2006; Monaghan, 2011; Wisker, Robinson, &amp; Shacham, 2007</td>
</tr>
</tbody>
</table>

**Development of affective attributes and internal drivers for individuals.** Participation in a community of practice can encourage the development of individuals’ personal motivators and learning in the affective domain. Students motivate one another and keep pace with the program and their peers, as well as establish a sense of accountability to one another that helps in accomplishing academic tasks. Students grow emotionally and experience changes in attitude and their perception of self. As students grow and become more confident of their knowledge, as well as their ability to understand and also impart knowledge, they find their voice and their identity as new scholars in their chosen discipline. Self-directedness increases as well.
Community of practice theory accounts for much of this transition and transformation as individuals move from positions of peripheral to full participation. Table 3 illustrates indicators of student success within this category, and links it to the research in which it appeared.

**Table 3**

*Evidence of Community of Practice Supporting Affective Development*

<table>
<thead>
<tr>
<th>Internal drivers / affective attributes</th>
<th>Crede, Borrego, &amp; McNair, 2010; Govender &amp; Dhunpath, 2011; Green, 2006; Janson, Howard, &amp; Schoenberger-Orgad, 2007; Lee et al., 2006; Wisker, Robinson, &amp; Shacham, 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain confidence, decrease doubt, find voice, develop identity</td>
<td>Dondlinger &amp; Jones, 2008; Ferreira, 2010; Green, 2006; Tobbell, O'Donnell, &amp; Zammit, 2010</td>
</tr>
<tr>
<td>Increases satisfaction with learning experience</td>
<td>Govender &amp; Dhunpath, 2011; Lee et al., 2006; Willetts &amp; Mitchell, 2006</td>
</tr>
<tr>
<td>Motivation, pacing, shared progress</td>
<td>Janson, Howard, &amp; Schoenberger-Orgad, 2007; Lee et al., 2006; Willetts &amp; Mitchell, 2006</td>
</tr>
<tr>
<td>Overcome obstacles, reduce isolation</td>
<td>Ferreira, 2010; Janson, Howard, &amp; Schoenberger-Orgad, 2007; Willetts &amp; Mitchell, 2006</td>
</tr>
<tr>
<td>Increases persistence</td>
<td>Mackey &amp; Evans, 2011; Monaghan, 2011</td>
</tr>
</tbody>
</table>

**Impact on learning.** Social, situated, and collaborative learning can all have a positive impact on individual students’ learning. The participation in meaningful and challenging discussions, and in the co-creation of knowledge that happens in communities of practice increases higher order thinking. This participation also allows students to learn by doing, especially when the community of practice is structured to address the "practice" of being a student or a practitioner in a specific discipline. It creates a learning curriculum, i.e., a curriculum that privileges the learner and everyday experience. In the studies discussed earlier, it was found that students produced higher quality materials and were better prepared for their doctoral defenses, as well as more likely to join their professional colleagues after graduation, when engaged in coursework that was influenced by community of practice principles. With
respect to students learning in transdisciplinary areas, participation and collaboration within community helped broaden their experiences and their comfort in working across disciplines.

Table 4 highlights the research that provided evidence of increased learning when community of practice theory is applied in graduate education.

Table 4

![Evidence of Increased Learning When Community of Practice Applied in Graduate Education](image)

**Sustainable Education**

Community of practice theory offers a potential structure to help effect a paradigm change in higher education. In this next section of the literature review I focus on sustainability in higher education. I specifically targeted research and writing that addresses or calls for a paradigm change in teaching, learning, and the organizational structure of higher education. The most influential authors for me were Stephen Sterling (2001, 2003, 2004, 2009) and James
Pittman (2004), and the most influential editor and author was Arjen Wals (2007; Arjen Wals & John Blewitt, 2010; Peter Blaze Corcoran & Arjen Wals, 2004, 2006; Arjen Wals & Tore van der Leij, 2007).

Stephen Sterling called for a new educational paradigm in response to the current educational system that perpetuates unsustainability rather than sustainability (2004, p. 49). Referring to David Orr’s 1994 work *Earth in Mind*, Sterling noted that there is not a crisis in education but rather a crisis of education, as the current model fosters unsustainable perspectives that privilege human domination over the more-than-human world (Sterling, 2004, p. 54), and what Glasser called the “the orthodox notion of progress” (Glasser, 2009, p. 51). Wals and Blewitt (2010), also influenced by Orr, agreed, “most universities are too often still advancing the kind of [Western scientific] thinking, teaching and research that leads to unsustainability and ignoring alternative ways of knowing and being” (p. 70). Further, Wals and Blaze Corcoran (2006) noted that “a more sustainable world requires new thinking that can break the cycle of unsustainable knowledge creation and transfer, un-sustainable technological development, and unsustainable [sic] consumption patterns tied to un-sustainable economic principles” (p. 108).

Sterling’s argument is thus that more of the same type of education is not what is called for to fix this “crisis of unsustainability” (2004, p. 22); instead, a shift is required in the “educational culture which both develops and embodies the theory of sustainability and practice in a way which is critically aware” (2001, p. 22). This shift requires “a necessary transformation of higher education towards the integrative and more whole state implied by a systemic view of sustainability in education and society” (Sterling, 2004, p. 50). Sterling referred to this new approach as *sustainable education* (2001, p. 22; 2004, p. 50).
In a broad sense, Sterling called for educational institutions to become learning organizations, i.e., organizations that learn. As shown earlier in this review, communities of practice are essentially learning organizations. Sterling made it clear that he is looking away from “learning through education,” which is really about the provision of education, and looking toward “learning within higher education,” which is about the “guiding paradigm” (2004, p. 50). Learning within education is situated learning on a large scale, and lessons from communities of practice can help explain and guide ways in which this learning occurs. James Pittman made the same point in a different way. His argument was that:

for a dynamic vision of sustainability to embody the idea of change towards being ‘sustainable,’ there must be a critical assessment guiding continuous improvement. Thus, sustainability is a process characteristic, not static end state; carrying an implication that health and integrity are sustained only though ongoing attention to a dynamic balance of behaviors and conditions. (Pittman, 2004, p. 201)

Similarly, the Peoples’ Sustainability Treaty on Higher Education, drafted by 25 higher education organizations, agreed that for education to be transformative, as sustainable education should be, then higher education should first transform itself (Daniella Tilbury, 2012, p. 2). Transformative learning requires the reflection and critical assessment referred to by Sterling and Pittman earlier in this section, and is predicated on an educational institution’s continued learning about itself and its place in the world. Toward this end, the Peoples’ Sustainability Treaty on Higher Education also included, in its section on Commitments, several competences required of an institution, all of which would serve to enhance continued organizational learning: “systemic thinking; critical reflective thinking; futures engagement and values clarification; the ability to deal with complex and contradictory situations; the capacity to work in partnership in order to facilitate transformative actions towards sustainability” (Tilbury, 2012, p. 5).
Sterling (2009) made the point that “learning can either serve to keep a system stable, or enable it to change to a new state in relation to its environment” (p. 71). Learning can happen at different scales with different types of results. In describing orders and levels of learning, Sterling discussed first order learning as maintenance or basic learning; second order learning as meta-learning, or a fundamental change that changes the system (citing Ison & Russell, 2000); and third order learning as epistemic learning, or “learning about learning about learning” (2004, p.56), which leads “to a complete change of worldview or epistemology” (2009, p. 72).

According to Sterling, second order learning is the minimum level required for the “questioning and re-ordering of assumptions” necessary for meeting sustainability challenges (Sterling, 2009, p. 72). A paradigm change in higher education to one of sustainable education, however, requires a different worldview, and third order epistemic learning is necessary for a change of that magnitude.

**Complexity, living systems, and sustainable education.** Change in the way one sees the world also affects “ways of coming to know [and] is a pre-requisite for changing what [one does]” (Nadarajah Sriskandarajah, Richard Bawden, Chris Blackmore, Keith Tidball, and Arjen Wals, 2010, p. 560). From a systems thinking perspective, this is comparable to a living system choosing which outside influences are triggers for internal changes (Fritjof Capra, 2002, p. 36), determining how to interpret those external influences, and reacting, adapting, or otherwise learning and changing in response to those triggers.

A mechanistic worldview that interprets the world as reducible to “the sum total of the motions and interactions of [component] parts” (David Selby, 2009, p.165) is insufficient for dealing with contemporary complex issues addressed by sustainable education. An example from
Davis Brent, Dennis Sumara, and Rebecca Luce-Kapler (2008) clarifies the dilemma of a mechanistic worldview, making it easier to see why a change in perspective is needed:

…machines like clocks and refrigerators, as well as physical systems such as billiard ball collisions and chemical reactions, are indeed the predictable sum of their parts. With a thorough knowledge of the motions of the pieces, one can predict the behavior of the whole. [However, this] approach has been almost useless in efforts to understand and predict phenomena that include large-scale economies, ecosystems, and brains. …These are complex systems. They can never be reduced to their parts because they are always caught up with other systems in a dance of change. (pp. 76-77)

A reinvention of higher education as sustainable education is complex, multilayered, and cannot be reduced to individual parts or solved through linear thinking. As Capra (2009) wrote,

education for sustainability is less a matter of transmitting the content of ecology to citizens, and more about utilizing the principles underlying ecological processes in helping communities and their members respond to the challenge of sustainability in ways appropriate to their situations. These principles not only help people to better understand nature, but help them to better understand themselves and the communities in which they live and work, and to design education for sustainable living based on those principles. (pp. 13-14)

Utilizing the principles of ecological processes, as Capra suggested, also implies the application of whole systems thinking and design. Ecological, human, and even educational communities, for example, are essentially a sum of their relationships rather than a collection of discrete parts, and the sustainability of a community “is not an individual property, but the property of an entire network” (Capra, 2009, p.13). In other words, in order for higher education to address sustainability it cannot position itself as apart from the rest of the sustainable, or unsustainable, world. This idea is elaborated by Sterling, who writes that “an ecological worldview then, is essentially a ‘living systems’ and relational view, wherein everything, including human agency, unavoidably participates in the dynamic condition and future of the whole because everything is part of the whole” (Sterling, 2009, p. 67).
This is key in understanding that sustainability is not an add-on topic for a university curriculum, but instead an essential characteristic of a dynamic educational system that learns. As Wals and Blaze Corcoran concluded, “the place of sustainability in the curriculum of higher education is not one of integration but rather one of innovation and systemic change within our institutions that will allow for more transformative learning to take place” (2006, p. 107). To be clear, the transformative learning they called for is as much an institutional as an individual trait of sustainable education. This is a change in educational worldview, to one where education and sustainability are inextricably linked: as part of the whole, each learns from, influences, and is part of the other. Adjusting the educational worldview in this way would help meet, for example, Patricia Mische’s (2004) challenge to educators to develop “a new mind, [as in] a new way of seeing and being, [and] of learning to be in the world as responsible, creative members of the community of life, with co-responsibility for the next stages of planetary evolution” (p. 49).

Social learning, communities of practice, and sustainable education. Our current educational system—which is also a social learning system—is criticized by thinkers and writers such as Sterling (2004), Wals and Blaze Corcoran (2006), and Mische (2004) because is it perpetuates unsustainability. This illustrates Glasser’s (2009) observation that “social learning, as maladaptation, can effectively drive and perpetuate unsustainable behaviors” (p. 54). Because social learning is driven, at least in part, by the members of the community (Arjen Wals & Tore van der Leij, 2009, p. 19), the possibility of reaching a critical mass of sustainable education minded members provides hope for a paradigm shift as espoused by Sterling and addressed in earlier sections of this review. Stated another way, a reorientation in worldview is conceivable as part of a social learning process experienced within a community of sustainable education practitioners which would contribute to Sterling’s educational paradigm shift.
Arjen Wals and Tore van der Leij (2009) linked social learning and sustainability closely, and, for me, emphasized the recursive as well as engaging nature of sustainable education as a living, learning system:

from a social learning perspective, the emergence of sustainability in the context of education can be viewed both as an evolving product and as an engaging process. Hence, sustainability as a social learning process is more interesting than sustainability as an expert pre-determined transferable product (i.e. as set by a policy, code of behaviour [sic], charter or standard) (p. 18)

Glasser (2009), commenting that social learning is not well defined for some, also pointed out that there is “no lucid, well-developed social learning for sustainability paradigm” (p. 56). It is true that defining sustainability, especially within the context of how it should be treated within higher education, is complex. In a UNESCO-sponsored workshop on education for sustainable development and higher education, Wals and Blaze Corcoran (2006) summed the problem thus:

The ill-defined and uncertain nature of working towards sustainable living and the complex and contextual nature of higher education itself, do not allow for universally applicable recipes for implementing sustainability in higher education. …At the same time, reliance on the instrumental use of education, training, and communication promote or even force one particular view of sustainability, is problematic as well, particularly in higher education where critical and autonomous thinking should be emphasized. (p. 103)

Communities of practice, if resilient and truly engaged in continual learning, can provide the diversity, adaptability, competencies, and partnerships to deal with the complexities inherent in a sustainable education paradigm. A transformation of knowledge structures is called for in the Peoples’ Sustainability Treaty on Higher Education as part of an overall paradigm shift in education. The treaty suggested communities of practice as part of a strategy to transform the knowledge structures to better address global challenges holistically (Tilbury, 2012, p. 2).

According to the treaty, this change in structure “would cut across the traditional knowledge
disciplines, theoretical and methodological mainstay and engage with communities of practice to facilitate the co-creation, co-design and co-production of knowledge” (Tilbury, 2012, p. 2).

Recognizing that the world’s current problems cannot be solved by current thinking, Tilbury (2009) wrote that “sustainability will require social learning on a grand scale” and made a series of suggestions for how this might happen (p. 118). She addressed learning based change for sustainability as “[seeking to] implement systemic change within the community, institutions, government and industry through a process which is underpinned by the following key components,” and listed: systemic thinking; envisioning; critical thinking and reflection; partnerships for change; and participation (Tilbury, 2009, p. 118).

Effective communities of practice can exhibit the learning based change components enumerated by Tilbury (2009). In fact, communities of practice often form in response to a complex problem or situation, and one of their key characteristics is the ability to continuously negotiate meaning and learn on an ongoing basis (Wenger, 1998). They have the potential to be flexible and adaptable, traits of organizations that are critical for understanding and addressing current educational, environmental, social, and economic complexities. Jana Dlouhá, Donald Huisingh, and Andrew Barton (2013), for example, questioned whether the role of education is to perpetuate the status quo, or to “provide skills for innovative leadership and adaptation to dynamic social, climatic, technological and economic changes” (p. 7). Closely related to Sterling’s observations on epistemic learning, Sriskandarajah, Bawden, Blackmore, Tidball, and Wals (2010) commented that the “more complex the epistemic perspectives of learners, the greater their capacity to deal with complex, messy uncertainties” (p. 569).
Chapter Summary

This study adheres closely to the original community of practice research by Lave and Wenger (1991) as a social learning theory and as a perspective for informing research (Wenger, 1998, p. 11). This study itself is situated within the field of sustainability education; and as an investigation of student success in higher education, it has the potential to influence the direction of sustainability education.

This review of the literature reflects the focus of my research by first introducing the origins of community of practice theory and key characteristics of a community of practice based on the original theory. I then discussed several cases where it has been used in higher education, organized by themes related to how it has been applied that emerged from this review. I presented indicators that the application of community of practice theory in graduate education can have a positive effect on student success. Because several indicators are evident across themes, I have categorized them by ways in which they contribute to student success, very briefly discussed them, and associated them with the relevant literature in tables.

I briefly introduced the term sustainable education as coined by Stephen Sterling (2001, 2004) and discussed the need for a paradigm change that requires an adjusted worldview and transformation of higher education that takes a “systemic view of sustainability in education and society” (Sterling, 2004, p. 50). As a holistic system that continually learns, sustainable education includes communities of practice as a mechanism for supporting new knowledge structures needed for meeting the complex challenges of an ever changing world.
Chapter 3: Research Design and Methodology

As noted earlier, this research was originally intended to explore most deeply the current role(s) of stories and storytelling within and between cohorts, and the impact of stories on individuals’ success as students. An important discovery from analysis of the data, however, is that while a community of practice is emerging—while it is in its nascent stages, as is the one under study here—the points of contact where stories can be exchanged become as important as the stories themselves.

Data gathering, done within the boundaries of the communities of practice framework, focused on collecting stories and other data about knowledge exchange activities that are relevant to the practice of becoming and being a successful graduate student in the field of sustainability education. Participant observation as a member of Cohort 5 and as a student attending the residency colloquia and spring symposia, survey responses, anecdote circles, and interviews were used to identify and elicit stories. A grounded theory approach was taken in analyzing the corpus of data gathered, with the intention of formulating a theory of supported student success.

This chapter begins with a brief history of the program that served as the test bed for this research. This background sets the context within which the study participants are situated as students. This is a collaborative program that does not create a competitive atmosphere among the students, as some other graduate programs might. This program is also strongly rooted in student self-directedness, and admits individuals from a wide range of academic and professional backgrounds. All of these factors contribute to making this a uniquely structured and populated program. The history and context are followed directly by a brief description of the study site.
and participants overall, as it is important to consider them in light of that context. More specific details about participants within each method are found in the individual method summary.

Having set the historical context for the study site and the general makeup of the participants, this chapter then introduces mixed methods as my chosen approach and discusses the major influences on my research design, including systems thinking and appreciative inquiry. Grounded theory is then presented as the primary method of inquiry and analysis for this research.

Having established the background for how and why this research was designed as a mixed methods study, I then briefly discuss several ethical considerations and issues related to participant protection. I chose to place this information prior to the presentation of the individual methods, as these considerations are applicable across all methods.

The individual research methods (survey, anecdote circle, and interview) are then offered, and within each I examine its rationale, the instrument design and implementation, the analysis process for the data, and issues related to data security. The chapter concludes with an overall summary of the research design, data gathered, and analysis that took place.

**Context: History of the Prescott College Ph.D. Program in Sustainability Education.**

The context and background for the study presents information about the Prescott College Ph.D. program in Sustainability Education, how long it has existed and what its premises and primary goals are. It is within this context that the current study has been conducted. Prescott College has a unique perspective on, and structure for, sustainability education, all of which has been important to consider when collecting and analyzing the data on students and the development of communities of practice. It is my hope, however, that the overall design and execution of this study can be used within different types of graduate programs, such that greater insights can be
achieved regarding how communities of practice develop and how academic programs can best facilitate and nurture their growth.

When originally proposed, the Ph.D. program at Prescott College was geared toward—and even titled—the Pedagogy of Sustainability. The unifying concept for the program, and what would bring student and faculty strengths together, was to be “sustainability” (Ph.D. Discussion Group, 2001, p. 1). Each student would be able to design a unique program, with sustainability as a unifying concept that also provided the flexibility to vary with the student’s course of inquiry (Ph.D. Discussion Group, 2001, p. 1).

Prescott College as an institution asks students at all levels to demonstrate competence and not simply acquire credits for degree completion. Initially, the program was envisioned as self-paced and bounded by three phases that supported such competency development. Phase one was to be a one year required residency at the college. The second phase focused on demonstrating competencies in qualitative, quantitative, and grant writing skills while also adhering to limited residency requirements. The final phase culminated in the production of new knowledge in the form of the dissertation.

In 2002, the proposed Ph.D. program had evolved to more closely align with the fields of study already present in the Master of Arts Program (MAP), a community-based graduate program. In this vein, the proposed Doctor of Philosophy Program would grant the Ph.D. within three fields of study: Environmental Studies, Educational Studies, and Psychological Studies (Jeanne Cashin, Rick Medrick, Paul Sneed, & Steve Walters, 2002, p. 1). These specific areas of study, it was felt, aligned most deeply with the college’s mission, and each held several areas of concentration relevant to sustainability. It was expected that interdisciplinary collaboration by students and faculty across all three fields would be critical, not only contributing “to the
uniqueness of studying at Prescott College, [but also demonstrating] how the creation of
topology is interconnected and can provide a context for looking at problems and questions
from alternative perspectives” (Cashin, Medrick, Sneed, & Walters, 2002, pp. 1-2).

At the time, the stated mission of the college was:

… to educate students of diverse ages and backgrounds to understand, thrive in, and
enhance our world community and environment. We regard learning as a continuing
process and strive to provide an education that will enable students to live productive
lives while achieving a balance between self-fulfillment and service to others. Our
philosophy stresses experiential learning and self-direction within an interdisciplinary
curriculum. (Cashin, Medrick, Sneed, & Walters, 2002, p. 2)

Since then, the mission has only changed slightly, primarily with the addition of one line
addressing critical thinking, ethical action, and sensitivity to the more-than-human world:

It is the mission of Prescott College to educate students of diverse ages and backgrounds
to understand, thrive in, and enhance our world community and environment. We regard
learning as a continuing process and strive to provide an education that will enable
students to live productive lives while achieving a balance between self-fulfillment and
service to others. Students are encouraged to think critically and act ethically with
sensitivity to both the human community and the biosphere. Our philosophy stresses

By 2002 the proposed program was considerably more developed, and clearly reflective
of, Prescott College’s non-traditional education format and self-directed philosophy. The first
year residency requirement had been reduced to a limited residency of one month per year,
during which time the student would engage in colloquia and conferences. The program itself
had codified its innovative design with four stated characteristics or supporting pillars.

The first characteristic of the proposed program centered on ‘responsibility.’ In this
model “both the student and the college are responsible for creating a learning environment that
is unique, challenging, and different that most Ph.d. [sic] programs” (Cashin, Medrick, Sneed, &
Walters, 2002, p. 4). As further stated in the proposal, “Our program design takes the responsibility for doing what other colleges and universities will not do, and does this with the expectation that only new and innovative learning and practicing citizen leaders will make a difference in this world” (Cashin, Medrick, Sneed, & Walters, 2002, p. 4).

The second unique characteristic involved ‘reviving the learning culture.’ This new educational program and model was intended to “invigorate the nature and purpose of a learning environment” (Cashin, Medrick, Sneed, & Walters, 2002, p. 4). In reviving the learning culture, the college places “…students in leadership and stewardship positions, [and] cannot be bound by convention and wishes to combine what works best from many traditions. The Ph.D. Design fosters personal growth, integrity, openness, and responsibility for the community and the world” (Cashin, Medrick, Sneed, & Walters, 2002, p. 4).

The third characteristic of the proposed program was ‘publishing to reform’ and planned for student production of one qualitative and one quantitative research article, each prepared for publication. This component of the program, while allowing students to demonstrate competencies, was intended to encourage and foster student contributions to “reform, change, and/or social issues. This philosophical design places emphasis on content/action of journal writing, which encourages students to have integration in their passions, learning, and altruistic concerns” (Cashin, Medrick, Sneed, & Walters, 2002, p. 4).

Finally, ‘cooperative learning groups’ as a characteristic was built into the proposed program. Opportunities for small group collaborations were by design and intended to foster interdisciplinarity and shared creativity (Cashin, Medrick, Sneed, & Walters, 2002, p. 4). Through the colloquium and conference format, students would be encouraged to “interact, present, form interdisciplinary bonds of knowledge, and create projects that demonstrate the
inherent helpfulness of open communication between disciplines” (Cashin, Medrick, Sneed, & Walters, 2002, p. 4).

By 2004 the program proposal had focused the Ph.D. in the single field of Education, with a concentration in Sustainability Education. The title of the new proposal—Ph.D. Program in Education: Education for a Sustainable Future—reflected this new orientation by succinctly capturing the essence of both the mission of the college and the philosophy of the intended program. The 2004 proposal was a culmination of more than a decade of planning and discussions, as well as the fielding and resolving of important questions from the Commission on Institutions of Higher Learning of the North Central Association of Colleges and Schools. At this point also, the mission of the college was expanded to include the additional line noting “students are encouraged to think critically and act ethically with sensitivity to both the human community and the biosphere” (Cashin, Medrick, Sneed, & Walters, 2004, p. 1).

From here the program proposal was clearly able to articulate how the multi- and inter-disciplinary areas of strength at the college could combine to support a doctoral program in Education, with a concentration on Sustainability Education. To this end, the proposal stated that the doctoral program would bring together curricular specialties from the Masters level such as Alternative and Experiential Education, Environmental Education, Sustainability Science and Practice, Ecopsychology, and Educational Psychology. The program would be a unique, low-residency program that combined “expansive, interdisciplinary inquiry with intense, individualized research and practice” (Cashin, Medrick, Sneed, & Walters, 2004, p. 1). It would be “focused sufficiently to generate collaborative and challenging scholarly discourse” while still retaining the flexibility to allow for individual learning goals (Cashin, Medrick, Sneed, & Walters, 2004, p. 2). Shared foundational courses and the common thread of sustainability
education as a core theme provides breadth to the program, while individual studies and dissertation research provide depth (Cashin, Medrick, Sneed, & Walters, 2004, p. 2). The program was developed and approved in time for it to launch in timing with the United Nations’ 2005-2015 Decade of Education for Sustainable Development and in 2005 admitted its first class.

The Limited-Residency Ph.D. Program in Sustainability Education at Prescott College currently operates on a hybrid low-residency and online instructional model. In addition, and although Prescott’s program is heavily self-directed, it follows a social, cohort-based learning model. In 2005, nine students were admitted as the first cohort. The first six cohorts ranged in size from nine to 13 students. In 2011, the program’s growth doubled, with the admission of 20 or more students in each of cohorts seven and eight. At the time of this writing (Winter 2013) the program had granted 24 doctorates and had over 57 current students enrolled. In 2012 when this study began, the college had admitted its eighth cohort of students, which is the last cohort of students to have participated in this research study.

The basic trajectory of the Ph.D. program is for students to enter with a preliminary plan for a self-directed learning experience and a proposed research project. Students complete intensive instructional residency experiences (colloquia) and foundational coursework together, followed by individualized, mentored coursework and dissertation research. Additional residency requirements are met through attendance and participation in regular symposia, where students present their work as it progresses, participate in and conduct workshops, and network with other students, sustainability educators, and the local Prescott community.

Each entering cohort completes the three foundational courses during the first year. These courses include Sustainability Theory and Practice I and II; Transformational Learning and
Sustainability Education I and II; and Modes of Inquiry: Interdisciplinary Graduate Research Design I and II. This foundational coursework sets the common stage from which all students are encouraged to embrace and apply a broadened sustainability perspective that encompasses social justice, economics, and ecology. Education and transformational learning is the fourth imperative for thinking broadly about sustainability and designing our research and work to promote a just and sustainable world. It is also about learning within an educational model that is more holistic through awareness and understanding “… of human potential and the interdependence of social, economic, and ecological wellbeing” (http://www.prescott.edu/learn/phd-sustainability-education/phd-foundational-courses.html). Finally, all students explore research design and scholarly writing in preparation for embarking on their own dissertation research project.

Late in the first year, the students are assigned a core faculty member from the Prescott College faculty. In the second year, students begin inviting scholars to mentor individualized courses in their specific research areas. Often, these mentors become students’ dissertation committee members, while the students’ core faculty from Prescott generally serve as the committee chair.

Students may design content courses together and collaborate on their work under a shared mentor. Most recently, cohorts have been encouraged to share single-credit seminar courses mentored by a Prescott faculty, in which small groups of students have regular, focused check-ins about their research, their scholarly progress, and to discuss collaboratively and solve any issues they may be experiencing.

As shall be seen in the analysis of the data collected for this study, each of the program components mentioned above has an impact on—or as in the case of the seminar courses just mentioned, is an outgrowth of—students’ relationships with each other, with the academic
content of the program, and with mentors and faculty. Ultimately these program components and the student relationships they foster become important catalysts for the spontaneous growth of a community of practice within the graduate student population.

**Study Site and Participants**

The site for this study was the Prescott College Ph.D. program in Sustainability Education, and the participants were all current doctoral students and alumni from the program. When considering graduate programs to approach to study student behavior and the possible spontaneous development of one or more communities of practice, Prescott College’s program was the most available in a stable and reliable way and the program administration was supportive of the study. More importantly, it was the place where, as a member of the program, I observed the behaviors and communication streams that inspired my curiosity about whether communities of practice develop among students who are helping one another, and whether understanding that behavior might be of benefit to doctoral programs that wish to more fully support the success of their students. If I had chosen any other program, I would have been an outsider: a faculty member, an administrator, or an unknown researcher and any of those statuses could have significantly changed my relationship with the student participants, potentially introducing a disruptive perceived power structure. One early research idea was to find similarly-sized, hybrid delivery model graduate programs to compare, but I ultimately felt that exploring one program deeply through a specific community of practice lens and a trio of interactive data gathering methods would provide more robust and detailed data and allow me to test a methodology that could be repeated in studying other programs in the future. Prescott College’s program is also small enough to provide a manageable set of possible participants, large enough
to have variety and diversity in participants, and new enough to still be developing in terms of its communities and sub-cultures.

As described in the earlier section on Study Context, Prescott College’s program uses a low-residency, hybrid-delivery model that combines face-to-face residencies with online course content and cohort connections. After completing the core courses in the first year, a student’s work becomes more self-directed and, with the exception of shared courses or seminars, the student interacts with course mentors in a variety of ways most comfortable for them and their mentors. These student-mentor relationships are exclusive, and the student is no longer regularly in direct contact with his or her peers based on coursework; they must find other ways to stay in touch. My communication with participants for this study was a combination of face-to-face, online, and telephone interactions that reflect that nature of the program itself.

The population for all active areas of this research was limited to the students who were enrolled in or had graduated from Prescott College Ph.D. Cohorts 1 through 8, as those were the cohorts established at the time of the study. Note, however, that all of Cohorts 1 through 10 and some administrators are potentially represented in the passive areas of this research, such as through participant observation during symposia or in online social media spaces.

Active participants were self-selected in that they chose to respond to the survey and/or the invitation to participate in the anecdote circles. Interview participants were self-selected by their response on the initial survey indicating that they were amenable to being interviewed. No administrators or faculty were permitted to participate in any of the active research areas.

**Participant pool.** The original roster of current students and alumni that I received from the college for the purpose of this study included 111 names with contact information. Excluding myself, the possible students from which to draw were limited to 110 individuals. Ultimately,
however, the pool was reduced to 85 candidates based on viable email contact information. Of this pool 60 current students and 25 alumni were represented.

An online survey was sent to these 85 individuals and 41 responses were received. Within those responses, 31 individuals indicated that they were willing to be contacted again as part of the study and thus formed the primary pool of contacts for the subsequent anecdote circles and interviews. Invitations to individuals in the self-selected contact pool, plus an open call for participation during the Spring symposium, yielded 16 anecdote circle participants. Data collection wrapped up with six interviews, with only one interviewee overlapping their participation with an anecdote circle. Figure 2 illustrates the overall pool of study participants.
Total study participation. Overall, out of 85 potential participants, 44 individuals participated in the survey, anecdote circles, and interviews. All of the interviewees and most of the anecdote circle participants had submitted surveys, and were included within the 41 survey responses. There were 3 anecdote circle participants who had not also submitted survey responses. Table 5 breaks down the numbers of participants by method.
Table 5
*Students Participating in Each Data Gathering Method and Cohorts Represented*

<table>
<thead>
<tr>
<th></th>
<th>Current Students</th>
<th>Alumni</th>
<th>Total per method</th>
<th>Cohorts Represented</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anecdote Circle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interview</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Influences on Research Design**

A qualitative, mixed methods approach. This study is a qualitative investigation using mixed methods (Michael Quinn Patton, 2002) to collect and analyze the data. The paradigm for this research is informed by whole systems thinking and related frameworks that are reflective of systems and are often used in an organizational change context. These organizational design and change frameworks include community of practice theory, whole systems thinking, appreciative inquiry, and anecdote circles. This is an appropriate combination of influences for informing the direction of this study as I am interested in determining if a self-organizing system is developing among graduate students and, if so, how that is happening and in what ways it is supporting the success of those students.

A qualitative research approach is appropriate because it allows for collection of data about the perceptions and lived experiences of students engaged in the process of being students, and how they are responding to those experiences in positive and effective ways. As Michael Quinn Patton (2002) stressed, “what people actually say and the description of events observed remain the essence of qualitative inquiry” (p. 457). The goal of this research is to develop a theory of supported student success that is firmly grounded in the collection, analysis, and synthesis of qualitative data.

A theory of supported student success is intended to be informative to institutions that want to find additional ways to support graduate students. Simply recognizing that a community
of practice may be forming and encouraging and nurturing it would be one supportive way an institution could react. An institution observing an existing community of practice that is doing great, supportive work could learn lessons about strengths it could invest in with an eye to continuing to improve that good work. Or an institution could simply recognize when a student community of practice is compensating for gaps in support that the institution could easily provide, and it steps in to provide those services so that the community of practice can address more complex issues that students encounter.

This research is looking specifically at students’ experiences, relationships, and the shared endeavor of being a student. It is looking at a system that is dynamic and developing and does not lend itself to quantification that is deeply meaningful. This is a naturalistic inquiry that delves into the processes of that developing system and does not change, alter, influence, or test reactions of the system. As a naturalistic inquiry it could not be completely designed at the outset and, through an iterative process (Patton, 2002, p. 44) in keeping with grounded theory, was adjusted in subtle ways as the study progressed (for example, shifting from story circles to anecdote circles as a data collection method). Although this study is situated within a specific academic program, it is not a program review and does not make evaluative judgments about the academic program or the institution within which it is housed.

**Influence of systems thinking.** Overall, this research is informed first by community of practice theory as a way to look for and identify the structure and characteristics of a system that self-organizes in support of a group of people engaged in a shared endeavor and who collaborate through an informal network to co-create domain-specific knowledge. It is influenced by systems thinking primarily because, in general, “…self-organizing systems [and] non-linear feedback systems [such as the one under study here] are inherently unpredictable. They are not
controllable. [And] they are understandable only in the most general way” (Donella Meadows, n.d.). As Donella Meadows (2001) further wrote, “we can’t surge forward with certainty into a world of no surprises, but we can expect surprises and learn from them and even profit from them” (p. 2). This is part of the cycle of students learning on their own and learning from one another. Each surprise that results in, or from, overcoming a hurdle, discovering a new collaboration or synergy that benefits the student in an exceptional and memorable way has the potential to become a story or an anecdote or a shared bit of advice for another student or series of students so that they may benefit as well. It becomes one of many catalysts for change and improvement in the system, or in this case, in the growth and establishment of a community of practice that supports students in the practice of becoming and being a successful student.

Having something to share—wisdom, advice, a funny story—has the added benefit of helping establish new relationships and to deepen existing relationships. It is these relationships that form the network that becomes the ecosystem that enables a community of practice to function, remain vital, and behave in a resilient way over time and across multiple generations of students.

Systems thinking encourages investigators to see the wholes. In looking for patterns, systems thinking helps to identify those that emerge from the interactions between and among the parts of a network or networks, and helps avoid making static ‘snapshot’ observations (Peter Senge, 1990, p. 68-69). As Peter Morgan wrote, systems thinking is less a formula and more a perspective for observing flow and movement (2005, p. 4). When taking a systems thinking perspective, the focus is on the whole rather than the parts. If the focus is too directed on the parts, the full understanding of what is happening might escape the analysis (Morgan, 2005, p. 12).
Community of practice theory and systems thinking are nicely aligned, and share obvious similarities. Morgan’s description of a system could easily be about a community of practice:

Systems behavior is largely driven by shared interests and identity, information, processes and relationships. Systems, and especially loosely-coupled ones such as networks, are held together by some sort of shared identity and meaning in the form of values, core beliefs, competencies, principles, purpose and mission. Effective systems have some sort of coherence and shared understanding (although not necessarily integrity) at their core. This combination of identity and meaning also helps to create the internal energy that, in turn, leads to the deeper capacity which is the foundation of systems performance. (2005, p. 14)

Whole systems thinking as applied to organizational change can be flipped and considered instead in terms of the spontaneous development of a new system, as opposed to one an institution or organization is trying to design. In writing about a whole systems design approach to organizational change, James Pittman (2004) described the approach as beginning “with individuals identifying together a seed of shared vision and organizational ideology. This seed is cultivated through strategic collaboration of a diversity of stakeholders in the design of organizational structures and managerial patterns aligned with shared values” (p. 203). This active approach to organizational change may also be reflected in a self-organizing system, one that begins with a seed and then negotiates its own organizational structures and managerial patterns in order to support a group with a shared vision or mutual endeavor such as a nascent community of practice might. Organization and management, rather than take the shape of an institutional structure, can manifest as collaboratively agreed upon communication structures, creation and availability of shared artifacts and values, and reification of the work and processes the system experiences as it grows and adapts over time.

Systems thinking is important to this research as it constantly reminds me that this study is about a phenomenon that is relational and non-linear, and relies on the connections and
relationships more so than the fragments. Further, in analysis of the data it is important to keep in mind what Stephen Sterling described as systems thinking, and place an emphasis on “process … [and] complex dynamics rather than a limited cause-effect, with patterns rather than detail, [and] with wholes rather than parts” (2003, p. 103).

**Influence of appreciative inquiry.** Another organizational change strategy that influenced the design and overall direction of this study is appreciative inquiry. Originally I was struck by Shaun Harper’s anti-deficit reframing of questions about the success of black male students in college. His approach reframed deficit-oriented questions to look for strength-based data instead. For example, the deficit-oriented question “Why are Black men’s relationships with faculty and administrators so weak?” was reframed as “How do Black men go about cultivating meaningful, value-added relationships with key institutional agents?” (Harper, 2012, p. 6). Harper’s flipping of the paradigm from deficit to strength-based research led me to appreciative inquiry as a strength-based approach to investigating what is working within organizations.

A common approach to conducting research or to implementing organizational change is to look for the problems to solve or inefficiencies to eliminate and zero in on them rather than taking lessons from what is working well. Robyn Stratton-Berkessel illustrated the irony in this by comparing it to those who place bets at racetracks: the gamblers look for horses with particular strengths and winning potential to bet on, and not for the weakest horse in the race (2010, p. 16). Appreciative inquiry looks for the healthy, positive strengths in an organization and invests in them (Stratton-Berkessel, 2010).

Appreciative inquiry when applied as a method for organizational change is an action-oriented cycle that begins with discovery of the ‘positive core’ competencies and moves on to dream, design, and destiny stages of the cycle (often abbreviated as D4). This study, however, is
not an action research project and the aim is not to implement organizational change but rather to
determine if organizational change is happening in the formation of a graduate student
community of practice and if so, to find the major strengths. Thus, from the perspective of my
research, appreciative inquiry is used to inform how the research design implements a strengths-
based rather than deficits-based approach to finding the indicators that are contributing to student
success, as opposed to looking only for barriers or problems or other potential deficits in the
students’ attainment of success.

The primary influence from the appreciative inquiry model is the discovery stage of the
cycle, where the goal is to gather data about what is working well within the context of the
organizational question or situation—in this case within the context of graduate students coming
together, forming a community of practice, and supporting one another in navigating their
doctoral journey. When implemented for organizational change purposes, appreciative inquiry
begins by bringing people together to actively discuss the most inspiring stories from the
organization through paired interviews. Part of the value of sharing the stories with one another
is that the act of sharing helps begin the change process. In other words, change begins the
moment people begin talking about what is working. This, in fact, is also an effect that anecdote
circles can have when they are used as a method for organizational change, as shall be shown
later in the methods section. While this research is not intended to actively change or influence a
community of practice that is developing among the Prescott College Ph.D. students as part of
the research project, this change potential of the discovery stage of appreciative inquiry and also
of anecdote circle participation was important to consider when crafting questions and prompts
and establishing interactions with students. It is possible that the act of discussing what is
working for the students had a change effect. If that is the case, then it is especially good that I
have chosen a strengths-based approach as part of the research design as that is the direction in which any change effect should manifest.

Appreciative inquiry, in the discovery stage, is about telling and hearing the stories about the ‘healthiest moments’ and most positive attributes of a system (Stratton-Berkessel, 2010). The positive core uncovered during the discovery cycle is the sum of all of the positive attributes. Similar to what I am looking for in terms of community of practice, characteristics and examples of what is working well for students in terms of their success, appreciative inquiry looks to identify “…cultural values; descriptions of engaged work; of technologies, systems, and processes; increased knowledge of individual and organizational capabilities; and elevated potential for future change” (Stratton-Berkessel, 2010, p. 33). In other words, influenced by Harper’s anti-deficit paradigm and appreciative inquiries’ strength-based approach, in this study I am looking for the attributes that make up the ‘positive core’ of a graduate student community of practice.

Ethical Considerations

Participant protection. Care has been taken to construct an academically rigorous and meaningful research study, including clear and transparent communications with all potential and actual study participants. Prior to conducting this research, I successfully completed online training in human research from both the National Institutes of Health Office of Extramural Research and the Collaborative Institutional Training Initiative (CITI).

The college’s Institutional Review Board approved this study’s research design, methodology, strategies for reducing risks, and protections for participants’ privacy and confidentiality. Any changes to the design or to the data collection instruments were submitted as addendums and approved through the college’s IRB process before implementation. For
example, in the original approved IRB documentation, one data gathering method was described
as story circles, rather than anecdote circles. As the research design developed, this method
changed slightly and the documentation was updated, approved, and filed with the college to
reflect a new emphasis on anecdote circles instead of story circles.

**Informed consent.** Detailed informed consent forms explained in writing the purpose of
this research; the reasons why the individual had been invited to participate; what they could
expect in terms of time, risk, and compensation; how their contributions were recorded; their
right to disengage from the study at any time without prejudice; the protection of their privacy
and confidentiality; and contact information in case they had any questions or concerns.
Appendices F-H contain examples of each consent form. Informed consent procedures and forms
received IRB approval prior to the study’s launch.

Online survey participants were presented with a screen containing the informed consent
information, and they were required to click and agree before being presented with the actual
survey. Anecdote circle participants each signed a paper copy of the consent form prior to the
opening of the session and extra copies were available for them to take with them for future
reference after the session ended. Interviewees were emailed a copy of the form, which they
signed and returned via email or by using the HelloSign secure online document signature
service (see www.hellosign.com for detailed information) prior to being interviewed.

**Anonymous data.** Unique codes were assigned to all participants and used to designate
individuals in all textual data, including transcripts or recordings, survey spreadsheets, and
rosters of participants. Only I had access to the key for the codes.

The survey was constructed, distributed, and reports were generated using the Qualtrics
survey software. The option to allow Qualtrics to anonymize results was selected and I was only
able to associate an individual with their answers if they explicitly provided their information as part of the survey. Otherwise, Qualtrics disassociated the respondent from his or her responses in the system.

Professional transcriptionists who worked with the audio files were made aware of the confidential nature of the materials prior to their hire. Transcriptionists were provided with pseudonyms or codes to use for the speakers in audio files, and when transcripts were returned, I checked and changed any additional names to codes. The exception was when a participant mentioned by name a person who was not a study participant. Often these were names of faculty or college staff and were not changed in order to maintain clarity when analyzing the data. For the protection of all individuals, however, no identifying names are used in this. More details about the process followed within each method are included in the section addressing that particular method.

Upon completion of this research study, all audio files will be erased, as will survey panel information and the participant code key (no printouts of the key or student roster were ever made). Online survey results stored in Qualtrics will be deleted as well. Anonymized survey reports and transcripts, in both print and electronic formats, will be retained for possible future use.

**Conflict of interest statement.** Given that I expect my doctoral degree to be granted by the institution that is serving as the site for this research, any potential conflict of interest is primarily wrapped in the notion that my research results may be compromised or incompletely presented if they were to portray the Prescott College program or its students in a negative light. This study, as stated earlier, is not a program review nor does the research design include any
plan to make evaluative judgments about the Prescott College program, its students, or the institution.

To be clear, I am looking for successes and strategies to support success based on how students are working collectively to help themselves and one another. This is not and has never been a program review and while the study site and participants are based at Prescott College, the ultimate goal is to collect robust data, and to create and test a method that can be repeated in other programs to verify further if the theory of supported student success that I have generated is transferable and translatable.

**Research Design: Methods**

**Grounded Theory.** Grounded theory method, as succinctly introduced by Antony Bryant and Kathy Charmaz (2007), is a systematic, inductive, and iterative inquiry process that employs constant comparative analysis “for the purpose of constructing theory” (p. 1). Grounded theory method is more accurately described as a family or set of methods, as it relies upon a combination of many different methods, processes, and strategies for gathering, analyzing, and interpreting data (Birks & Mills, 2011, p. 5). This family of methods adds to the overall rigor of grounded theory and is discussed in more detail in the following section.

As mentioned, grounded theory method is an iterative process whereby data is gathered and analyzed constantly rather than gathered completely and then analyzed. As Bryant and Charmaz (2007) described this, it is “the iterative process of moving back and forth between empirical data and emerging analysis [making] the collected data progressively more focused and the analysis successively more theoretical” (p. 1). The use of a variety of strategies allows for “…imaginative engagement with data… that creates a space where the unexpected can occur” (Bryant & Charmaz, 2007, p. 25).
This research into supported student success is first informed by participant observation. The collection and analysis of survey responses begins the firm data collection process. Survey responses inform the themes explored during anecdote circles and some questions in the interviews. Interviews round out the data collection and address points from the analysis of surveys and the anecdote circles through deeper conversation with individuals. At any given point in the process an analysis of one data point can show the need for more data collection until a level of saturation (within that theme or category, etc.) has been achieved. Saturation, in this sense, is considered achieved when the data gathered no longer continues to introduce new ideas, concepts, or themes to the analysis. Saturation in this study is also achieved by participant observation of social media interactions. I have chosen grounded theory as the method for analyzing the data collected for two main reasons. First, it provides a very structured and rigorous series of methods (Strauss & Corbin, 1990; Birks & Mills, 2011) for studying the practice of becoming and being successful graduate students and how learning within this context is enhanced through the sharing of stories throughout the community. Second, it provides a way to reach beyond the presentation of a case study or program review by formulating a theory of supported student success that has the potential for broader adaptation in programs beyond those offered by Prescott College.

While case studies and similar descriptive presentations of research studies may organize data by themes or summarize them in other ways, they generally do not formulate a conceptual scheme. Grounded theory aims to explain rather than describe the phenomena under study, particularly through rigorous interpretation of data, conceptualization, and the creation of a storyline that explains the relationships between the concepts that make up the theory. It allows
for theoretical integration with the work of others in the discipline or field, which further validates and supports the theory that develops from the research (Birks & Mills, 2011).

**Verification in grounded theory method.** Grounded theory is valuable because it has deliberate, internal structures built into the methods for verification, what I have referred to previously as a family of methods. It also encourages a check of the analysis against the published literature as part of the analysis process—a theoretical integration of the resulting theory with the results of others’ work. Grounded theory also requires a measure of creativity, enabling the researcher to question data in better ways, thus eliciting new insights and fostering development of novel theoretical formulations (Strauss & Corbin, 1990; Birks & Mills, 2011).

A variety of techniques are combined in grounded theory specifically to help the researcher open up their thinking with defined procedures to help break through assumptions (Strauss & Corbin, 1990; Birks & Mills, 2011). For example, questioning the data—Who? What? Where? How? How much? Why?—opens it up and leads to potential categories, properties, and dimensions, all of which are used to organize and constantly compare the data throughout the process leading to theory. Analysis of words, phrases, and sentences raises questions about meaning, and possible meanings are validated through additional interactions. Comparisons among concepts, categories, and properties of the data are systematic, using techniques such as turning concepts upside down and imaging the opposite (flip-flop) or taking a close-in or far-out perspective.

While specific techniques are used to reduce narrow thinking and break through researcher assumptions, the procedures employed in grounded theory—really a series of methods—are essential to a rigorous analysis of the data. According to Melinda Birks and Jane Mills (2011), these “…essential grounded theory methods include: initial coding and
categorization of data, concurrent data collection and analysis, writing memos, theoretical sampling, constant comparative analysis, theoretical sensitivity, intermediate coding, identifying a core category, and advanced coding and theoretical integration” (p. 9).

Finally, in judging a theory there are four criteria that measure the applicability of the theory to a phenomena: fit, understanding, generality, and control. First, a theory that “fits” is representative of the reality, is faithful to that reality, and is induced from diverse data (Barney Glaser & Anselm Strauss, 1967; Strauss & Corbin, 1990). Second, study participants and practitioners in the area studied should be able to understand a theory easily. Third, the data analyzed was comprehensive, interpretations were conceptual and broad, and the theory is abstract enough to make it applicable to a variety of related contexts (Strauss & Corbin, 1990). Finally, control is demonstrated when the theory is sufficiently robust enough that it can be used to guide future actions (Strauss & Corbin, 1990).

Data Collection Methods

This research used a mixed method approach to data collection in order to facilitate triangulation of data and also reduce the effect of error linked to any single method (Patton, 2002, p. 556). The data collection methods used in this research and discussed in this section include:

- Participant observation
- Survey
- Anecdote circle
- Individual interview

As shown in Table 6, several types of information were gathered. The table shows the data I expected, and subsequently gathered, for each type and which method was used to achieve that
goal. For example, the survey was used to collect demographic data such as age, geographic location, and family status.
Table 6  
Type of Information Study Intended to Gather, the Expected Data Within Each Type, and Methods for Collecting Data

<table>
<thead>
<tr>
<th>Type of information</th>
<th>Expected data</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contextual</td>
<td>Background information about the students: academic history, professional associations, family/home obligations, etc.</td>
<td>Survey</td>
</tr>
<tr>
<td>Demographic</td>
<td>Descriptive information about the students: age, gender, geographic location, cohort</td>
<td>Survey</td>
</tr>
<tr>
<td>Perceptual</td>
<td>Students’ perceptions: definition of success, sense of camaraderie and community, overcoming obstacles, identity transitions</td>
<td>Survey, Anecdote Circles, Interviews, Participant Observation</td>
</tr>
<tr>
<td>Anecdotal</td>
<td>Specific examples of students’ lived experiences</td>
<td>Anecdote Circles, Interviews, Participant Observation</td>
</tr>
<tr>
<td>Observed</td>
<td>Specific observed examples of students communicating, requesting information, sharing artifacts</td>
<td>Participant Observation</td>
</tr>
</tbody>
</table>
While all of the different types of information are important, the perceptual and anecdotal information are the types of information that are most critical to this research, as they provide insight into and direct examples of the students’ lived experiences. Figures 4 illustrates the questions and prompts used to elicit the perceptual data using each method.

Figure 4. Elicitation of perceptual information from participants. Each method is presented here, with corresponding questions or prompts intended to capture perceptual information.
In comparison, Figure 5 illustrates the questions and prompts used to elicit the anecdotal data using each method.

*Figure 2.* Elicitation of anecdotal information from participants. Each method is presented here, with corresponding questions or prompts intended to capture perceptual information.
Participant Observation. As a member of Cohort 5, I was able to reflect on a specific cohort’s experiences as a community of practice in order to begin outlining many of the situations and opportunities for gathering additional data via surveys, interviews, and anecdote circles. In addition, during the course of the project, I maintained brief observation notes of ideas for investigation and wrote memos, as prescribed in the grounded theory method (Birks & Mills, 2011), to aid in identifying further opportunities for gathering data as well as for generating specific questions for surveys and interviews. The observations and reflections are not addressed as specific data points within this dissertation itself, but were germinal to the strategy for collecting the data that was ultimately analyzed. Participatory observation, then, was primarily to reflect upon and come to a deeper understanding of the student experience in order to better guide research questions, discover further areas for exploration, identify additional study participants, etc., and was never intended to serve as an autoethnographic addition to the body of the dissertation itself. This approach to using participant observation to inform interview questions was inspired by Cecilia Katzeff and Vanessa Ware’s 2006 research on video storytelling as mediation of organizational learning. Their primary purpose for participant observation was to understand festival work and communication processes and craft better interview questions based on that experience.

Survey

Rationale. Surveys are generally used to answer questions about a population (Valerie Malhotra Bentz & Jeremy Shapiro, 1998). The overall student and alumni population in the Prescott College Ph.D. program is small enough that the survey could be sent to all of them, as opposed to selecting a sample as one might do if conducting a large study that relies statistically on aggregated answers. For this research, however, the survey was used to gather demographic
and contextual information about the students in the program in order to create a more detailed portrait of who the students are, where they come from both academically and geographically, and what some of their home responsibilities might be. It also gave them the opportunity to “opt-in” to future phases of the study. Having students indicate at the end of the survey if they were willing to be contacted again as part of this research was absolutely critical in establishing the self-selected pool of potential participants for the anecdote circles and interviews that followed.

**Survey design.** The survey questions and direction were informed by my research questions and participant observation as well as literature on the graduate student experience (See, for example, Patricia Adler & Peter Adler, 2005; Boyle & Boice, 1995; Hahs, 1998; Katherine Mansfield, Anjalé Welton, Pei-Ling Lee, & Michelle Young, 2010; Jane Tobbell, Victoria O'Donnell, & Maria Zammit, 2010). The survey collected demographic, contextual, and some perceptual information from the participants. See Table 7 for examples of each of these types of information.
Table 7
Examples of Information Types Collected with Survey

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Contextual</th>
<th>Perceptual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort admitted</td>
<td>Household structure</td>
<td>Definition of success</td>
</tr>
<tr>
<td>Graduated with cohort</td>
<td>Dependents</td>
<td>Influential advice received</td>
</tr>
<tr>
<td>Geographic location</td>
<td>Communication methods</td>
<td>Transformational moment</td>
</tr>
<tr>
<td>Age</td>
<td>Professional memberships</td>
<td>Identity moment</td>
</tr>
<tr>
<td>Gender</td>
<td>Previous degrees</td>
<td>Dream job</td>
</tr>
<tr>
<td></td>
<td>Time to complete previous degrees</td>
<td>Who provides feedback on publishable work</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Event/person/group most useful to topic refinement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reasons for communicating with peers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Characterization of peer support group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fears about completion</td>
</tr>
</tbody>
</table>

The actual instrument design followed best practices for questionnaires and web surveys (Jelke Bethlehem & Silvia Biffignandi, 2012; Scott Crawford, Mick Couper, & Mark Lamias, 2001; Paul Umbach, 2004), and was deliberately constrained by a target completion time of 20 minutes or less. A short survey reduces fatigue, helps reduce ‘saticifying’ answers, and encourages completion of the survey. Lists were kept short or divided across two columns to reduce primacy effect and to eliminate scrolling. Drop-down choices were limited to the geographic demographic questions, again to eliminate possible primacy effect. Answer boxes for open-ended questions were sized to suggest a particular length for the answer, but were able to hold as much as a respondent chose to write.

Forking logic was used for two questions but was accidentally broken and not fixed before the survey was distributed. This did not affect overall answers, however, because the respondent could simply skip the second part of the question if it was erroneously presented to them.
The only required answer on the survey was the agreement to the informed consent at the beginning. Without that agreement the participant could not move forward. No other questions required a response before the participant could progress to the next question. Forced answers are in fact an ethical consideration in surveys, as preventing a respondent’s movement to the next question can be considered coercive.

The survey questions, but not the actual web survey format, were previewed by two dissertation committee members and adjusted based on their feedback. The web survey itself was pre-tested on four members of Cohort 5, as well as on two ‘naive’ users unaffiliated with Prescott College or the Ph.D. program. The survey was again adjusted based on the pre-testers’ feedback. This final adjustment was what broke the forking logic.

There was one particular (and embarrassing) content flaw on the survey and that was the gender question. I had intended to be more inclusive with the possible options and had ‘other’ listed as a placeholder while I tried to determine additional appropriate language. The question on the surveys that were distributed remained unchanged from that point and I might have updated earlier test surveys rather than the final surveys. One respondent commented in a different open answer field that she did not want to choose “Other” for gender. After discussion with this respondent it was decided that for the purposes of the study “Female” was acceptable.

Two versions of the survey were distributed, one for current students and one for alumni. The only difference between the two surveys was the tense of many of the questions; for alumni the past tense was used; present tense was used for the current students.

*Survey distribution.* Using the Qualtrics online survey software, survey invitations were distributed to 85 current doctoral students and alumni across Cohorts 1 through 8. Of these 85 possible participants, 41 individuals responded—28 current students and 13 alumni—for a 48%
response rate. Four more individuals started surveys but did not advance past the informed consent screen. Of the total responses, 23 were received after the initial invitation was mailed. A further 7 were received after the first reminder email, and an additional 15 after the second reminder. Reminder emails are considered best practice in web surveys, and in this case effectively doubled the number of respondents (Umbach, 2004; Crawford, Couper, & Lamias, 2001).

**Self-selection via surveys.** Of the 41 respondents there were 31 who specifically indicated a willingness to be contacted again as part of this research. They included their names and contact information on the survey as part of this self-selection process. These individuals became the pool from which I recruited for anecdote circles and interviews.

**Survey analysis.** Reports on responses were generated using the Qualtrics software, and before formally coding them, I wrote initial reactions and memos on the reports for the open response questions. This helped me think in different ways about the responses and possible reasons for students’ answers. Free writing reflections like this also generated ideas for consideration later.

Coding for all of this research began with the data from the free-text responses in the survey using NVivo computer-aided qualitative data analysis software. The initial codes from the survey analysis were the basis upon which other codes were built for (and from, since this is an iterative process) the subsequent anecdote circles and interviews. All data were iteratively coded as new sets of data were collected, in keeping with the grounded theory methodology (Strauss & Corbin, 1990; Birks & Mills, 2011; Johnny Saldaña, 2013). Survey answers were also compared with anecdote circle responses and interview data for agreement and continuity. For example, in drafting the aggregate definition of student success, I began with the survey responses, then
checked them against the interview responses from the same individuals for general agreement. In fact, the individuals who were interviewed changed their definition of success very little, if at all, from their answer on the survey.

The survey reached the largest number of students in this study, while the anecdote circles and interviews were used for gathering detailed information from small groups and individuals. The survey data provided some basic demographic and contextual data about the students in the program as well as information that helped in the development of further themes to explore in the anecdote circle data-gathering phase. Themes for further investigation included:

- Cultivating effective mentor relationships
- Effects of camaraderie on individual persistence
- Participation in (cohort or overall graduate student) community

**Anecdote Circles**

*Rationale.* Anecdote circles are lightly moderated group discussions that differ from focus groups in that they are not intended to answer a specific question or test a hypothesis. As described by Paddy O’Toole, Steven Talbot, and Justin Fidock (2008), “…anecdote circles can usefully act as a way to capture representational stories about an organisation [sic], and act as a vehicle for the design of intervention strategies for beneficial organisational [sic] change” (pp. 28-29). Anecdotes rather than stories are encouraged, as they are specific examples of lived or observed behaviors or situations. Prompting a participant for an anecdote rather than a story helps keep the examples short and to the point. Participants, if asked to provide a story, may feel the need to provide a carefully crafted narrative with a beginning, middle, and end. In other words, stories are constructed whereas anecdotes are about real experiences. While they are not structured to answer a specific question or test a hypothesis, anecdote circles do have a particular
direction that is determined by themes the study is intended to explore. Generally speaking, they are not conducted in order to solve a problem but rather to share experiences. Exploration of themes is loosely directed through the use of question prompts.

Anecdote circles are used in organizations to overcome the limitations of interviews and surveys, especially when trying to evaluate project successes and shortfalls that may otherwise be difficult to measure (see, for example, Shawn Callahan, Andrew Rixon, & Mark Shenk, 2006). They are also sometimes used to facilitate organizational change (O’Toole, Talbot, & Fidock, 2008; Rohit Ramaswamy, Graeme Storer, & Romeck Van Zeyl, 2005).

Serious anecdotes (Thomas Davenport & Lawrence Prusak; David Millen, Michael Fontaine, & Michael Muller, 2002) are used in business to share, through anecdotal story, ways in which individuals or units have made significant improvements in their work, resulting in quantifiable results such as improved return on investment for the company. This concept of serious anecdotes was adapted for use in this study’s anecdote circles in order to better focus individuals’ stories on what they have learned and would share with others in order to help improve success as graduate students in the Prescott College program.

**Instrument development.** Data analysis from the initial surveys completed by study participants resulted in three themes for further exploration and investigation through anecdote circles. These themes were:

- Cultivating effective mentor relationships
- Effects of camaraderie on individual persistence
- Participation in (cohort or overall graduate student) community

Following a method by Shawn Callahan, Andrew Rixon, and Mark Shenk (2006), prompts were then developed within each theme using a three-component formula for effective
questions. This formula recommends that prompts begin with an image-building phrase followed by additional information to enhance the image, and then by an open-ended question that uses emotive words. Emotive words represent a range of emotions so as not to influence the direction of the person’s answer. “When” and “where” questions are used most often, as they are more likely to elicit anecdotes, whereas “how” and “why” questions are more likely to yield opinions. Based on this formula the following prompts were crafted and used to elicit anecdotes from circle participants.

Six prompts were developed, two within each of the three themes. Prompts were listed in a priority order so the most important from each theme would be covered during a circle, especially if time ran out and not all prompts were read. See Appendix D for the text of the prompts and the order in which they were presented during the anecdote circles. Table 8 lists examples of how perceptual and anecdotal types of information were captured in the anecdote circles.

Table 8
Examples of Information Types Collected with Anecdote Circles

<table>
<thead>
<tr>
<th>Perceptual</th>
<th>Anecdotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stories about own role as mentor</td>
<td>Stories about own role as mentor</td>
</tr>
<tr>
<td>Effects of camaraderie on persistence</td>
<td>Stories about sharing expertise</td>
</tr>
<tr>
<td>Participation in community</td>
<td>Advice on mentors</td>
</tr>
<tr>
<td></td>
<td>Advice on overcoming isolation</td>
</tr>
<tr>
<td></td>
<td>Advice on overcoming frustration</td>
</tr>
<tr>
<td></td>
<td>Stories about learning experience</td>
</tr>
</tbody>
</table>

Anecdote circle recruitment. Three anecdote circles were conducted on May 14, 15, and 16 during the 2013 Spring Sustainability Education Symposium held on the Prescott College campus in Prescott, AZ. Recruitment was accomplished via 24 personal email invitations to students and alumni who were expected to attend the symposium and who had indicated on their
survey responses that they were willing to be contacted. In addition, open invitations to participate were included on the program schedule itself. A total of 16 current students and no alumni participated in the anecdote circles (Table 9). There were three participants who had not responded to the survey and came to the anecdote circle based on the open recruitment message in the symposium program. Administrators and faculty were explicitly excluded from the anecdote circles, even if they asked to participate.

Table 9
Anecdote Circle Participants

<table>
<thead>
<tr>
<th>Date</th>
<th>Women</th>
<th>Men</th>
<th>Total</th>
<th>Cohorts</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 14, 2013</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>4, 5</td>
</tr>
<tr>
<td>May 15, 2013</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4, 5, 8</td>
</tr>
<tr>
<td>May 16, 2013</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>5, 6, 7</td>
</tr>
</tbody>
</table>

*Anecdote circle sessions.* Anecdote circles are comprised of 4-12 peers with a shared, common experience. In an organizational change setting, the facilitator would be aware of power issues and individual relationships between participants and seat or exclude them accordingly, but none of these concerns occurred during this study. The smallest anecdote circle had three participants and the largest had eight. While none reached the maximum target of 10 participants, they were sufficiently attended and the participants were very generous with their stories and feedback. Each session had a mix of cohorts and genders represented.

The rooms were set up in advance with 11 chairs in a circle and light snacks were provided. I used two digital recording devices for redundancy, in case one didn’t pick up well enough or the battery died or something else went wrong. In all three instances both devices worked perfectly and resulted in good, clear recordings.
The circles were run in a relaxed manner. Students were free to choose their own seating and were invited to stand, get snacks, or leave for the restroom at any time. Once participants were settled, the recording devices were activated. I was the facilitator for all three of the anecdote circles. I gave a brief background on the research project, and general instructions about how the anecdote circles would work. I explained that the prompts would be read aloud and I could clarify or provide examples answers if anyone didn’t understand the prompt, as they are somewhat awkward based on the construction method used to create them. Participants understood that specific examples of their own experience or an experience another person shared with them were acceptable responses, but not examples of something they had read about in the literature. Participants generally did a good job of regulating their own responses and reminding each other to answer with specific examples based on lived or shared experiences. Sometimes opinions or suggestions were offered, but the conversation quickly returned to anecdotal examples. Rather than restrict the flow to a specific order, the conversation was popcorn style so that students could riff off of each other’s examples if they were so inspired.

I adjusted the instructions to circles two and three based on feedback from the participants in the first circle. After completing the first session, the participants reflected that they had examples that were the same or similar as ones that had been provided by their peers. The group discussed the value in knowing when students had similar experiences, and I adjusted the instructions to the subsequent circles to let them know that they should feel free to indicate when someone else told a story that was the same or very similar to what their response would have been to the prompt. This did help with the flow and also with a better aggregate response during individual sessions. In other words, even though this research is not quantifying responses as a means to indicate importance, I am looking for themes and so it is important to hear similar
or identical stories from participants. This feedback from the first session’s participants helped improve the subsequent circles.

*Delivering the prompts.* The six prompts and themes for the anecdote prompts used during the anecdote circles were prioritized in the following order:

1. Cultivating effective mentor relationships
2. Effects of camaraderie on individual persistence
3. Participation in (cohort or overall graduate student) community
4. Cultivating effective mentor relationships
5. Effects of camaraderie on individual persistence
6. Participation in (cohort or overall graduate student) community

This allowed me to ask the most important prompt for each theme first, then cycle through the themes once more if there was enough time during a session. See Appendix D for the complete text of each prompt.

*Recording, transcription, and safeguarding data.* Each anecdote circle resulted in between 60 and 80 minutes of audio-only recorded conversation. One of the recording devices can record to an individual microchip, and each anecdote session was recorded to its own chip as a way of archiving a copy. The second recording device saved to its internal storage and those files were transferred via a USB connection to the MacBook Pro used for all of the research files. All files will be erased from the chips and the MacBook once this study is fully completed. Files have already been erased from the secondary recording device.

Video recording was not an option for the anecdote circles as I felt that it might inhibit students from speaking freely. I did not take written notes during the sessions because that also
may have had interrupted the flow of conversation and sharing of examples. I made these specific decisions with respect to this method for gathering data from participants.

Each recorded session was professionally transcribed. The first anecdote circle participants introduced themselves before speaking and thus their names were associated with their voices on the recording and were transcribed that way. For all students I maintained a master list of codes in MS Excel to which only I have access, and once I received the transcript I immediately executed a search and replace on the file, replacing participants names with their corresponding code.

For circles two and three the participants did not introduce themselves before speaking. For these recordings I provided pseudonyms and timestamps of the first time the person spoke for the transcriptionist to use to associate a name with a voice. When these transcripts were returned, I again did a search and replace, changing the pseudonyms to their appropriate participant code. Sometimes a specific student was mentioned by name as part of an anecdote. I was able to replace these instances with codes as well, as I have codes for all students on the original roster and not just the ones who have actively participated in the study.

Anecdote Circle data analysis. The initial coding was a blend of exploratory and provisional coding (Saldaña, 2013). It was exploratory in that it was open to the use of any appropriate labels, while at the same time it was provisional because it anticipated that the data would illustrate certain concepts and categories that were predetermined by the guiding questions and design of the anecdote circle prompts. For example, camaraderie, participation in community, and effective mentor relationships were provisional (pre-determined) codes. In fact, had nothing coded within these anticipated areas, it would have been a good indicator that the anecdote circles did not perform as planned and the data gathered was not on target.
Provisional codes such as participation in community grew larger, parent categories (i.e., building community), sibling codes (e.g., institutional facilitation and contributing to community), and child codes (i.e., intergenerational communication).

Initial coding was done by hand, highlighting and marking code and memos on the transcripts. Provisional codes based on survey, anecdote circle, and interview instruments were used, as well as codes already generated as part of the process of analyzing the survey results. A codebook, with descriptions and explanations for codes, was developed in parallel with the coding process and a corresponding entry and explanation were added any time a new code was generated. This part of the process increased substantially when coding the anecdote circle transcripts.

Transcripts were then loaded into NVivo and coded more densely. The code tree and associated codebook grew and were tracked in NVivo, along with memos. Shortly after coding the transcripts in NVivo, however, software incompatibility required me to switch to a different CAQDAS program. Security software on my Windows-based laptop interfered with NVivo and periodically refused to allow it to write to its underlying SQL database. At the time NVivo did not have a Mac version available, and running it in Parallels was inefficient. I switched to Dedoose as my CAQDAS software because it is hardware and operating system independent, is cloud based, and requires only a web browser and Internet access to be usable. While some of the reporting features in NVivo are more powerful and customizable, Dedoose was sufficiently able to meet my needs for coding transcripts; managing a code tree, codebook, and memos; analyzing code occurrences; and extracting summaries from the documents.
While coding, and any time I reviewed data, I generated memos that were valuable in continued code development, in surfacing patterns in the data, and in looking holistically at the overall picture the data presented in the final analysis.

**Interviews**

*Rationale.* The collection of data in this study deliberately funneled down from broad, contextual information via the surveys, through anecdote circles focused on specific community themes, and finally into interviews with individuals to gain a deeper look at specific details of interactions within the community. Interviews with selected individuals were conducted in order to examine and describe more fully the survey responses regarding communication and community and to explore in more detail themes that emerged from the anecdote circles. Interviews were used to elicit specific stories about intra- and inter-cohort communication strategies and characteristics that identify an active community of practice. Interviews were semi-structured and were based on questions prepared in advance with the expectation that interviewee responses would lead to additional avenues for investigation (Herbert Rubin & Irene Rubin, 2012, p31). Prepared questions, however, made comparison across interviews more manageable and kept the interview focused on eliciting information about real interactions between and among students in the community under study.

*Instrument development.* Interview questions were originally designed to complement the survey questions and the anecdote circle prompts. Each instrument asked unique questions, but each also asked a few same or parallel questions in order to check responses across all methods. For example, the survey and the interview both asked for the student’s definition of success, as well as whether they had experienced an identity moment as a sustainability educator.
Similarly, prompts in the anecdote circle regarding how students were helping one another have a parallel interview question as well as similar, although more specific, questions on the survey.

Survey and anecdote circle responses had been well aligned with the types of information I was looking to collect as well as the expected data. After the preliminary survey and anecdote circle analyses were completed, I reviewed the interview questions, which had already been approved by IRB in the initial application, and found that they did not need to be adjusted. I tested the interview questions with mock interviews of two individuals not associated with the study site or the community at the heart of this research. Primarily I tested for flow in reading the questions and comprehension on the part of the interviewee.

Table 10
Examples of Information Types Collected with Interviews

<table>
<thead>
<tr>
<th>Perceptual</th>
<th>Anecdotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition of success</td>
<td>Stories from other cohorts</td>
</tr>
<tr>
<td>Identity moment</td>
<td>Identity moment</td>
</tr>
<tr>
<td>Role as knowledge producer</td>
<td>Role as knowledge producer</td>
</tr>
<tr>
<td>Ways to help one another</td>
<td>Ways to help one another</td>
</tr>
<tr>
<td>Ways cohort divides or organizes</td>
<td>Ways cohort divides or organizes</td>
</tr>
<tr>
<td>Realization of community or peer mentoring relationships</td>
<td>Realization of community or peer mentoring relationships</td>
</tr>
<tr>
<td></td>
<td>Advice on overcoming barrier</td>
</tr>
<tr>
<td></td>
<td>Who provides critical correction</td>
</tr>
<tr>
<td></td>
<td>Advice on mentors</td>
</tr>
</tbody>
</table>

Recruitment of participants. Six interviews were conducted, with one participant from each of Cohorts 3 through 8. The pool of potential invitees was generated from the list of people who (a) responded to the original survey and (b) indicated on the survey that they were willing to be interviewed. Anyone who had also participated in an anecdote circle was excluded, and then random numbers were assigned to the remaining 18 names using a random number function in Excel. I then invited the individual with the lowest assigned number from each cohort. This
helped me to avoid playing favorites or privileging people whose names I recognized. If the first interview invitation was declined or ignored I repeated the process within that individual’s cohort group. For each entering cohort, there were between one and four names of potential invitees.

There were three rounds of invitations to possible interviewees. There was no fourth round because only cohorts 1 and 2 remained unrepresented and there were no more graduates left to invite from cohorts 1 and 2.

Initially, students who participated in an anecdote circle were excluded from the interview pools in order to gather data from as many students as possible. However, there were exceptions made to this process when I exhausted the names in a cohort without any responses to the interview invitations. The first exception was made when the single self-selected, non-anecdote circle candidate from Cohort 6 did not respond to the interview invitation. In this case, based on the interview self-selection data from the survey, the only option was to invite a student who had also participated in an anecdote circle. That person agreed and was subsequently interviewed.

One other exception was made in the interview invitation process. When no alumni from Cohorts 1 or 2 who had self-selected for an interview responded to the interview invitation an IRB exemption was granted in order that I could invite additional respondents who had not previously self-selected to be interviewed. Those invitations also went unanswered and ultimately there were no interviews conducted with any students from Cohorts 1 or 2. Table 11 shows the characteristics of the interviewees. Because the possible pool was so small overall, I do not associate gender and cohort in this table in order to protect the interviewees’ identities.
Table 11

*Characteristics of Interviewees*

<table>
<thead>
<tr>
<th>Cohorts represented</th>
<th>Gender</th>
<th>Survey participants</th>
<th>Anecdote circle participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 4, 5, 6, 7, 8</td>
<td>Women</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

*Brief description of the interview process.* Six interviews were conducted, each lasting between 60-90 minutes. The original minimum number of interviews was five, but I decided mid-semester to try to get eight, one from each cohort. I was only partially successful in increasing the number of interviews.

Because membership in cohorts drifts as some individuals take longer to graduate and are adopted by the subsequent cohorts, it is the cohort with which the individual entered the program that I have used as that person’s identifying cohort. No students from cohorts 1 or 2 responded to the interview invitations, so the final total was six interviews with participants from cohorts 3-8.

All interviewees were emailed the Informed Consent form. All signed and returned Informed Consent forms prior to their interview. The online service HelloSign was used to give the participants the option to sign the PDF online rather than print, sign, and return as a scanned copy.

Interview questions were emailed to the interviewees prior to the interview so that they would know what to expect. Only two participants mentioned that they read the questions in preparation for the interview.

*Recording and safeguarding of data.* All interviews were recorded using the StartMeeting conference call service, which combines a conference phone call system with recording controls available via the web. Participants were able to use a toll free number to dial the conference line. Recordings are currently stored in the cloud in my StartMeeting account and
access was provided to the transcriptionist via a protected URL. All recordings were professionally transcribed and the transcripts edited for anonymity of the interviewee. As noted earlier, once this research is complete the recordings will be erased.

**Analysis.** Using Dedoose, I completed the initial coding the six interviews. As discussed for the previous methods, codes were used across all information sources, including anecdote circles, interviews, interview notes, survey responses, and survey notes. Coding interview transcripts followed the same procedures and protocols as coding of survey and anecdote circle data. Once all data sources had been coded, a second round of coding was conducted across all transcripts; this is part of the constant comparison process and was expected.

Several new codes were added based on the interview coding process. Codes became more loosely organized than they were after coding the anecdote circles and many of the new codes were rather free floating and not merged together or arranged within the hierarchical structure. The complete code tree is listed in Appendix A.

**Methods and Data Analysis Summary**

This chapter has introduced the historical context for the study site and participants, and discussed major influences on the design of this research. Each method—survey, anecdote circles, and interviews—used in this mixed-methods approach were discussed in terms of the rationale for use, the design of the data collection instruments, the recruitment of participants, and the general deployment of and results obtained using that method. The coding procedure was described briefly. Once all data had been preliminarily and then axially coded, looking for larger themes and categories, I began drawing conclusions. Using selections from transcripts, I compared them for agreement across data types, participant type, and major emergent concepts or themes. These conclusions are discussed in the following chapter that presents the findings.
Chapter 4: Findings

As outlined earlier, this research used two specific models based on the work of Etienne Wenger and others as the framework for organizing this research and the lens for analyzing the collected data: the concept of digital habitats and the community of practice model. The goal was to determine if a community of practice has developed among the doctoral students in the Prescott College Ph.D. program and if so, whether it aids the students in their role and practice of becoming, and being, successful students. This chapter begins by describing the students who participated in this study in order to establish context for the data they have provided. It then briefly discusses the aggregate definition of success as provided by the students. It was important to me to capture the students’ own definitions of success for two reasons: 1) to see how students’ definitions of success compare with general, measurable institution-driven measures of success and 2) to know what students consider to be markers of success in order to better understand their answers and anecdotes about moving along their academic path as graduate students.

After setting context for the data, this chapter uses tools from Wenger, White, and Smith’s (2009) digital habitats model to describe the ways in which students communicate. The communication network is essential to the formation, growth, and sustainability of the community of practice. An important discovery from analysis of the data is that during the emergence of a community of practice, the points of contact where stories and other forms of information can be exchanged become as important as the stories themselves.

Finally, the bulk of this chapter presents findings that indicate that a community of practice has indeed formed among the students and is in its nascent stages. These findings are arranged using Wenger’s characteristics of a community of practice as a framework; it thus closely follows the meaning, community, and learning sections of Wenger’s 1998 book.
Communities of Practice (pp. 51-102). Arranging the findings in this way aligns the data within Wenger’s logic structure for easier analysis.

Although these sections on meaning, community, and learning are presented separately and I provide examples from the data to illustrate each, in the reality of a community of practice they are all related and relational to each other: it is the constant interplay of each and all of these concepts that brings to life and holds together a thriving community of practice.

In Wenger’s model, “practice is about meaning as an experience of everyday life” (1998, p. 52). I therefore first look to the data to determine the practice of being a successful student as the meaning of the experience of being a successful student. Meaning, in this sense, is determined by applying the concepts negotiation of meaning, participation, and reification to the behaviors of the students as individuals and as a group.

I then illustrate how this practice is associated with community by addressing the three dimensions Wenger listed as the properties of a community (Wenger, 1998, p. 73): mutual engagement, joint enterprise, and shared repertoire. It is the association of practice and community via these properties that “defines a special type of community - the community of practice” (Wenger, 1998, p. 72).

Lastly, I present findings relevant to “shared histories of learning” (Wenger, 1998, p. 86) that are both revealed and predicted by the data. Shared histories in a community arise from a combination of participation and reification over time, and learning takes place when meaning must be negotiated from this combination. Communities of practice that persist over time continually learn through the renegotiation of what they already know through prior participation and reification as part of the negotiation of meaning in what is new – particularly when new members are included in the community of practice.
Student Characteristics

The following section briefly describes some of the characteristics of the students who participated in this study. This description is based on responses to survey questions designed to gather demographic and contextual information from the respondents.

Demographic and contextual information about the students based on the survey.
The students come to the Prescott College program from a diverse set of backgrounds, and the survey question showed very few students share the same or similar master’s degree. The survey question intended to demonstrate and document the wide range of backgrounds the students were assumed to bring to the program. While biology is a relatively popular undergraduate degree, business administration, environmental studies, and education-related degrees see the most overlap at the master’s level. Still, there are very few students with the same undergraduate or graduate degree. This supports the notion that the students enrolled in the Prescott College program do come from a wide range of educational backgrounds with little or no overlap in degrees, making them unique when compared to other, more homogenous Ph.D. programs.

Students were asked how long it took them to complete their last degree in terms of the normal amount of time expected for that degree. This was to check for any particular trend with respect to what students in the aggregate had as a history of completion rates. The alumni who responded to the question all indicated that they had finished in the normal amount of time. There was more variation in the past completion rates for current students. While the majority did complete in the expected number of years, three took an extra year, an additional three took an extra two years, and one student took more than two years beyond the expected time to complete their last degree.
Similar to the differences in degrees, there is little overlap in students’ memberships in professional associations. The survey question about professional memberships was intended to illustrate where individuals were identifying professionally, as well as to determine if there was any area of professional overlap across the Prescott College program. Although there is little overlap in professional organizations reported, there are a significant number of organizations listed, perhaps indicating a general affinity for communities of practice, or at least a sense of professional identity, in students’ professional lives.

Another unexpected result from the survey was in the area of household structure and dependents. The combined survey questions about households were intended to determine what outside family influences students have, particularly in the area of family dependencies. The literature about graduate education and characteristics of graduate students often mentions additional obligations, particularly from household structure and dependents, that more mature students bring with them to the overall experience (Bain, Fedynich, & Knight, 2009; Mansfield,
Welton, Lee, & Young, 2010; Tobbell, O’Donnell, & Zammit, 2010). These questions gauged those characteristics for this set of graduate students.

Table 13
**Household Structure**

The majority of students who responded to the survey are in marriage or life-partner arrangements. Nearly ¼ of the respondents are single female householders. Slightly less than half of respondents have dependents at home, and those dependents are primarily children. No one reported having dependent parents or spouses/partners. Table 14 illustrates the number of dependents participants have at home.
Students were also asked if they had any fears or concerns about not being able to finish their degrees. Those who responded that they did have concerns were able to provide more detail on the survey. Less than half of the alumni and slightly more than half of the current students had concerns about being able to finish their degree, as shown in Table 15.

Table 15
*Fears About Completing Degree*
For alumni, financial burden had been the primary concern, followed by the inability to balance family obligations and school. Of the 13 alumni who responded to the survey, ten finished their degrees within four years and three others took five years to complete. Current students who had concerns about completing their degree were primarily worried about the inability to balance work and school, followed by financial burden.

Table 16
*Fears About Completing Degree: Reasons*

*Note.* On this spider web chart, the closer the mark is to the center, the higher the degree of concern.
As shown in Table 17, the majority of students responding to the survey, both current students and alumni, were in the 30-49 year age range when the survey was administered.

Table 17

*Age Ranges*
Far more women replied to the survey, with 26 in total compared to the 15 men who responded. The ratios of participants by gender are illustrated in Table 18.

Table 18

Gender

Geographically, students were distributed widely, especially in the United States with 25 states represented. Alumni were all located in the U.S., with two additional countries represented in the current group of students. At the time of the study the program had students enrolled from three separate continents. Details of geographic distribution are not included here in consideration of participants’ privacy.

**Definition of success from the study participants.** Based on definitions from the surveys and follow-up questions during the interviews, the following emerges as the aggregate description of success as held by the students themselves. As noted earlier, I was interested in how students’ definitions compared with standard, institutional measures of success, as well as what was important to them as measures of success.

Pragmatically, students are interested in completing the requirements and earning the degree, acquiring credentials that may be required for further professional advancement. They
are also interested in the degree as a recognized career milestone that allows them to move forward with the sustainability work that they want to do at the level they wish to do it. Similarly, students describe success as being able to use, apply, and share the knowledge and deeper insights that they gain from intensive study and research.

Students recognize the following as indicators of their success:

- Completion of their degree as a personal accomplishment as well as an earned credential for further professional advancement
- Increased scholarly abilities, including deeper understanding of disciplinary content, improved academic skills, contributions to knowledge and the ability to put theory into practice
- Personal growth and transformational change, including confidence in their own voice, finding and maintaining balance during and after completing school, and unity between their avocation and personal lives
- Expansion of lifelong learning skills and tools, including the foundation of a network of like-minded colleagues with whom they can continue the conversations, scholarship, and work of sustainability education.

**Digital Habitats**

The ways in which students communicate with one another has a profound effect on whether a community of practice develops and thrives over time. A low residency, hybrid educational model such as Prescott College’s builds in important face-to-face time for students, but the majority of time students spend in the program is at a distance from the rest of the community. Wenger, White, and Smith (2009) noted that with respect to communities such as those experienced by the Prescott student cohorts, where most of the members do not work or
live near one another, “…separation in time and space is a fact of life that can make the experience of community difficult” (p. 56).

This does not necessarily preclude quality interactions and learning from taking place at a distance, only that more attention should be paid to the structure and facilitation of either the interactions themselves or the virtual space within which the interactions take place. As one goal of this research is to influence online learning, it is important to at least briefly consider parallels between digital habitats in the development a community of practice and the creation of meaningful virtual learning spaces. For example, Randy Garrison and Martha Cleveland-Innes (2005) found, with respect to online learning, that structure and leadership are crucial in engagement for online learners, and that “the reflective and collaborative properties of asynchronous, text-based online learning is well adapted to deep approaches to online learning [and cognitive presence]” (p. 145).

The formation and focus of a digital habitat is, according to Wenger, White, and Smith (2009), “an experience of place enabled by technology” (p. 38). Establishing a virtual space extends the bounds of community initiated during face-to-face meetings into both time and space, and reduces some of the difficulty individuals have in experiencing community at a distance. In actuality, this virtual space is a series of related, interconnected, and interacting communication methods that when combined form the digital habitat. This includes the face-to-face communications, in the sense that those interactions and the resulting relationships that form, even when minimal, make it easier for individuals to communicate virtually. One student, when describing the importance of spending time together in person and how important that is for communicating later, noted that:

Especially because it’s low residency and we hardly see each other and so having - even though it’s intense - having that interaction from 7 am to 10, 11, 12 o’clock at night I
think is a healthy thing because it creates a foundation for later when all we can do is talk on the phone. (Interview-0505, personal communication, September 26, 2013)

Wenger, White, and Smith made this quite clear: “No matter how technology-enabled they are, communities remain social entities and it is by enabling social processes that technology contributes to the emergence of communities” (2009, p. 191). Institutions and individuals who wish to foster technology support for communities of practice must observe and understand, according to Wenger, White, and Smith, which technologies enhance and enable the social processes of the community most effectively and target their support efforts accordingly. In some cases, this can mean making face-to-face time a part of the overall communication strategy.

One way to organize data to describe a digital habitat, based on Wenger, White, and Smith’s techniques, it to look at what tools are used, what platforms support those tools, what features make the platforms and the tools usable, and ultimately what configuration of tools and platforms sustains the community. In the next section, I outline the students’ preferred communication methods. These reveal the tools that students are currently using; and student comments about drawbacks or unfilled needs help determine what other kinds of tools or platforms would benefit them.

Preferred Communication Methods

Looking at preferred communication methods provides some insight into whether a community of practice is developing, what communication strategies work best for students, and pinpoints areas for further support by the institution or the community itself. During the first year when students share core courses taught by regular Prescott College faculty, they use the Moodle learning management platform to manage the classes and the corresponding discussions and file sharing. Also on the Moodle site students may participate in an All Ph.D. discussion area,
although traditionally this has seen very little use. The college does not create shared Moodle sites for students after the first year, nor does it support Moodle sites for mentored courses. This effectively discourages use of Moodle for any communication after the first year’s core courses — there is simply no reason for students to log in on a regular basis. In other words, when students shift from the core courses, there is little need or reward for continuing the use of the Moodle learning management system. Later in this section I address the important and relatively new use of social media and its impact on student communication and community building, especially as an alternative to Moodle.

**Survey results regarding communication preferences.** The survey asked participants to check responses for all methods of communication they use with individuals in the same cohort, with individuals in different cohorts, and with small groups of Ph.D. students. The choices provided were: email, in person, Skype, phone, Facebook, Moodle, and text message. For the question about communicating with small groups the additional options included: phone conference, Adobe Connect, and Elluminate. Respondents were also able to choose “Other” as an option and were provided space to write additional communication methods. Write in choices included: Google docs, Google hangout, Google chat, Basecamp, and handwritten letters.

Email was the most popular communication choice in the aggregate for all students for each type of communication measured on the survey.

**Communicating with individuals in the same cohort.** For male students and alumni, email tied with Skype as the preferred method for communicating with individuals in the same cohort. For female students and alumni, email was the preferred choice with the phone as the second most popular method for communicating with individuals in the same cohort. Preferences
for in person, phone, Facebook, and text messages varied by gender, followed by general agreement across genders that Moodle fell last in the list of provided choices.

Table 19
*Communicating with Individuals in the Same Cohort*

![Bar chart showing the number of respondents choosing different methods of communication for individuals in the same cohort.](chart)

**Communicating with individuals from other cohorts.** Email was again the most popular choice with respect to communicating with individuals from other cohorts, with Facebook coming in as the second most popular choice for both genders except for male alumni: none of the male graduates indicated that they used Facebook, the phone, Moodle, or text messages to interact with individuals from other cohorts. In fact, according to the survey, there is very little interaction in general between male graduates and individuals from other cohorts. Similar to the responses regarding communicating with individual cohort members, preferences for in person, phone, Facebook, Moodle, and text messages varied by gender, with write in choices tapering off at the end.
Communicating with small groups. In the aggregate, the top three choices for small group communication were email, phone conference, and Skype, with Facebook and in person tied for fourth place. Within and across genders and student type, however, the choices for communicating with small groups varied more than those for communicating with individuals. Skype, for example, is more popular with current students than with graduates. This may be due to newer students being more technologically savvy and enabled, and Skype having become more sophisticated than earlier in the history of the program. For several students, particularly starting with Cohort 5, Skype has also become an instrumental support tool for “Write & Skype” sessions where students gather on Skype to simply be present for one another while doing their independent writing work. Students in Write & Skype (also called “Skype & Type”) sessions are essentially present in the same room with one another while in reality they can be in separate states or even countries. It’s an effective way to share an immediate sense of camaraderie and it
has proved useful to several students in keeping them motivated and on track. One student shared the following anecdote about how important the Write & Skype sessions were for her. She had been working diligently in a new professional position and was not in dissertation mode, as she said, when the crunch time came for writing. She was having a difficult time getting started and Write & Skype sessions with two cohort-mates helped considerably:

The only reason I finished on time, [there were several factors, but] one major one was Skype & Type… The starting was the hardest part and having [my cohort mates] sit there on the other end [of a Skype session] - and I was struggling so hard to get rolling - and then once I got going, and they were there, it just rolled like this massive ball. You know and then there was no stopping it at all. (Interview-0505, personal communication, September 26, 2013)

Google chat is also mentioned as a way to be virtually present for one another while working independently, although as a tool it did not score as high in the survey results (perhaps because it was not listed as an option, students who listed Google chat did so as a write-in selection in the “Other” category). As a strategy, Write & Skype and Google Chat are both mentioned in the interview and anecdote circle data. Working together virtually in this way is also shared and discussed among students during colloquia.

The supportive actions taken by small groups of students, such as with the Write & Skype sessions, are very similar to accountability groups, which are a popular method for individuals to achieve specific goals by uniting with a small group of people tackling similar work (see, for example, Laura Vanderkam, 2014).
Communication needs and strategies revealed in anecdote circles and interviews.

The limits of the technology provided by the college is a source of frustration for students, and forces them to negotiate their own way into a configuration of self-structured, open-web solutions for gathering together. As mentioned earlier, a critical mass of students already using—or willing to use—Facebook as a communication tool is having the largest positive effect on the sense of community felt by students in the program. Moodle, for example, doesn’t function well as a platform for maintaining community beyond the first year, or to support and foster intergenerational communication. One student from Cohort 8 summed this up when sharing her disappointment with the lack of cross cohort interaction:

I was really disappointed when I came into the program with the lack of cross cohort interaction. It was kind of like... You know, this was back last fall [during Cohort 8’s initial colloquium], and well, you'll meet them all in May. I said well, I don't have to wait until May to meet them all. I would go on to the Moodle Ph.D. thing. And you know, there wasn't a whole lot of activity… (Circle-0808, personal communication, May 15, 2013)
Facebook, on the other hand, provides a microclimate that nurtures deeper connections, even though not all students are willing to participate. Another member of Cohort 8 compared Facebook with the first-year Moodle experience, noting the feeling of greater community generated by Facebook:

… our cohort is divided on Facebook. We have the anti-Facebook, don't, don't expect me to come to Facebook just for this. And then, we have the people who love Facebook. … I clearly am okay with Facebook, but what's interesting is that those of us who are on the Facebook page, we are deeper connected because we see the post of like [this student’s] sister is doing this, and [that student’s son is doing that], and you know, and it's just deeper details that come forward. And so, then when we do come back together, the Facebook crowd has well, how's your son doing, you know, and how's this and how's that. And you kind of see what's going on. ... On Moodle, we all kind of respond pretty professionally. We do a lot of cheerleading. At first I was a little like bothered. Like I had a slow Internet connection, and I just waited a minute to open this up to see somebody go “rah! I'm so glad you got this posted!” But I've gotten over it, and I'm glad that we're a cheerleading kind of cohort. But generally, most of our posts on Moodle will, can be really all kind of appreciative inquiry, we're getting there, and the posts on Facebook can be “I don't know how I'm ever going to get through this,” and then you get the Facebook support of “I'm with you man.” You know? And that kind of thing. So, Facebook seems like it's a little bit more... there's that greater community. (Circle-0808, personal communication, May 15, 2013)

While students who do not participate directly in social media are somewhat isolated, they still get some information about what happens in the Facebook cohort and cross cohort sites from their closer peers, as described in the following comment:

The person I corresponded the most with … would periodically send me a note saying well, this appeared on Facebook. It might be useful to you. Because I'm, I'm not going to get on that. I just don't trust that. … So then all of a sudden, you're isolated from this mainstream, if you're going to use that as a platform, a common platform. (Circle-0402, personal communication, May 14, 2013)

One student who acts as an information broker, conscientiously sharing Facebook information with her peers who will not participate in open-web social media, also wishes there was a way to
find a middle ground between Moodle and Facebook so that more intellectual discussions could take place:

…we have people that don't do it [use Facebook], and actually, I have become an intermediary to some of them because I understand some of the issues because I have some. So, I’ll actually call them up and say did you see So-and-so’s awesome map [posted on Facebook], by the way? (laughs) So, I'm okay with Facebook as a support thing… [but] there's not a lot of scholarly inquiry that goes on in either Moodle or Facebook. (Circle-0508, personal communication, May 15, 2013)

These comments are representative of others from interviews and anecdote circles, where study participants differentiate between the kind of communication on Moodle (sometimes more professional, sometimes too much cheerleading) and the kind of communication that takes place on Facebook (quick requests for help or sample documents, venting of frustrations, acts of sharing and kindness toward one another, deeper personal connections). Another interesting dimension of Facebook is that a student can post there and not only be reaching out to other students in the program, but also to their wider circle of family, friends, and acquaintances. This adds more layers of potential support for the student, and not just emotionally. Students who have a wide professional circle of Facebook contacts can ask for and receive specific academic help as well. During an anecdote circle, in response to a prompt about overcoming isolation, one participant explains:

And I was trying to write my introduction in a way that brought more of me into it, on suggestion from my committee. And I was at a point where I was really stumped. And I actually put a post, post out, not just to Prescott cross-cohort, on Facebook, and I said very clearly, this is what I'm doing. I'm having trouble integrating the personal part of myself into this narrative. Is there anyone out there, basically, is there anyone out there who can help? And I got a number of things. And one person, whom I had done an art of mentoring course with, and in his 60s, he's been working in a bunch of different fields for a number of years. And he lives in a log cabin in Maine. And he wrote back and said call me. And I called him, and we had an amazing discussion, not necessarily about the topic but around the topic. (Circle-0501, personal communication, May 14, 2013)
It is interesting that no students mentioned LinkedIn as an active social media tool for engaging with a wider professional community in the same way that Facebook is used. Prescott College Ph.D. students, faculty, and alumni are present on LinkedIn and it wouldn’t be a stretch to ask that network for help. Perhaps a site that is geared more for networking in a professional, employment-oriented manner such as LinkedIn stifles the types of outreach a student feels they can do on Facebook. Or perhaps LinkedIn is more of an avenue for questions and communication once the user feels that he or she is more expert or credentialed and thus safe in terms of potential future credibility and possibly employment. Shifting from Facebook to LinkedIn and what prompts that, and what types of communication are permissible according to the communicator would make an interesting future study in terms of community member trajectories.

Small group communication, especially communication in dyads or triads of students, appears to be the running thread that is pulling the overall community of practice together. It is certainly the strongest thread in terms of consistent and meaningful exchanges. Take, for example, the instances outlined above regarding peers acting as information brokers for their friends who are not participating on Facebook. In both of the examples above, the dyads had ongoing relationships based on shared interests in academic content and research methodology. They were already communicating with one another on a regular basis, primarily via email in the first case and through both email and phone conversations in the second. The information brokers already had a deep understanding of their peer’s interests, as well as their reasons for not engaging in a social media platform. Remembering them when an interesting piece of information or exchange occurred on Facebook and then relating that information would have been as natural as sharing a new and relevant article or call for conference papers. It has the
effect though, of keeping them at least somewhat in tune with the larger student community of practice; without that individual relationship the non-participant in social media would have remained otherwise isolated from that social media segment of community communication.

**Impact of Social Media on Student Communication**

In late 2009 a Cohort 4 student started a Ning site to meet the need for an online community space—a private social media environment—for the Ph.D. students. The effort struggled to take off, in large part due to students who did not want to log in to an additional site or for whom the initiative seemed too complicated or an intrusion on their own research and academic development time. Social media sites such as Facebook were still new enough for applications such as Ning to compete in the new media space created by Facebook. In April 2010, however, Ning restructured and discontinued the free version and without financial backing or active interest to continue the Ning site for the Ph.D. students, that effort ended as well.

With respect to connections created and maintained through online technology, Facebook has had a significant influence on cross-cohort communication. It is, in fact, a place where the majority of students are willing to connect and has been the most successful cross-cohort space in the time that I have been in the program. Cohort 5, for example, established its “Prescott Cohort 5 PhD Club House” in September 2010. Not all students in Cohort 5 were Facebook users, but a critical enough number used Facebook to make a private group a viable group-communication option. While this had the unfortunate effect of leaving a few non-Facebook users out of an immediate communication loop, they were conscientiously notified of important issues via email from students who acted as information brokers across platforms (e.g., Facebook, email, Skype, etc.). Most cohorts have one or a few members who will not participate
in Facebook for a variety of reasons, usually because of privacy concerns or as a way to reduce the amount of places they must log in. However, due to the number of students who actually participate, combined with its relative convenience, Facebook has been adopted as a de facto online community space. Cohort 9, for example, established their cohort-specific Facebook group well before their first in-person meeting during their introductory Fall colloquium meeting (Noël Cox Caniglia, personal communication).

In Oct 2010 Facebook updated and improved its Group feature (see http://allfacebook.com/new-facebook-groups_b20089). The group feature updates allowed for members to invite and include more members. Inclusion in a group was no longer dependent on one administrator for the group, eliminating a potential bottleneck to initial membership and general maintenance over time. A critical mass of students willing to use Facebook and the easier, more fluid way to invite members into private groups might have been critical for increased use of Facebook Groups by individual Ph.D. Cohorts. Ultimately, by mid-May 2012, a Cross Cohort Ph.D. Group had been established.

The Cross Cohort group includes some faculty as well as students. At the time of this writing, there were at least 66 members of the Cross Cohort group (there may be more that I cannot see, based on their privacy settings). The current description for the group is “Space for cross cohort collaboration, support and inspiration. Guidelines for posting: More so - questions, resources, personal sharing, invitations to collaborate, job postings etc. Less so - general news about the world.” A faculty member regularly posted general-interest sustainability information and essentially kept the group’s site overly busy. In November 2013 students agreed that the space should be reserved for posts directly related to Ph.D. work and not a place for posts simply about things that are happening in the world in general. This scoping of posts was especially
good for members who received email and push notifications when something new appeared on the group site, and who did not want to receive notifications unless something relevant had been posted. Shaping the nature of the conversation on the Facebook site as happened when the site was created, and then as it was reshaped in November of 2013 through brief conversation and consensus is indicative of the community reinforcing its practice—in this case, the practice of being graduate students—and focusing the group’s attention on the aspects of that practice which are most important.

Certainly there were many more posts by graduates from Cohorts 1-4 in the early days of the group than there are currently, but some of the alumni still post on occasion, especially if they have a personal or organizational achievement or announcement. Mostly, however, the posts are from current students who have a specific need or question about the Ph.D. work process. For example, students are requesting recommendations for technology solutions for staying in touch with committee members, contact information for editors and transcriptionists, and for sample dissertation proposals or qualifying papers (QPs). Facebook allows for the upload of files, and the Ph.D. students need a place where artifacts relevant to their work can be easily located and shared; this was mentioned in the anecdote circles and interviews. Creation and sharing of artifacts relevant to the needs of the members of the community is a hallmark of a community of practice and is discussed in detail later in this chapter.

The overall community of practice for the graduate students in this study is still finding the best ways to communicate in groups, and for placing artifacts in a place that is easy to locate, to organize, and to maintain over time. Facebook does not meet these requirements, but is fulfilling some immediate group communication needs while at the same time making the need for a shared space for artifact storage and retrieval more obvious. A recent effort of students and
the college has resulted in the implementation of the Digication ePortfolio system, which will help with the archiving of useful artifacts. The possibilities of Digication are discussed later.

**Community of Practice Characteristics**

This section first addresses practice as the meaning in experience, then combines this with the concept of community in a way that illustrates what comprises a community of practice and how the graduate student community of practice meets these criteria. Finally, it examines the importance of how learning takes place over time within a community and whether the graduate student community of practice is developing a learning culture. In order to follow Wenger’s logic in describing the characteristics of a community of practice, this entire section closely follows the meaning, community, and learning chapters of Wenger’s 1998 book *Communities of Practice*.

**Meaning**

In Wenger’s model, the concept of meaning is important because “…practice is about meaning as an experience of everyday life…” (1998, p. 52). In the case of a graduate student community of practice, individual and collective student experiences combine with ways in which the community chooses to find or create meaning from those experiences. However, the creation of meaning is also an experience, so it is important to think of meaning as both an iterative and recursive process. It is akin to meta-cognitive strategies individuals might use to help themselves learn how to learn more effectively, for example. Thus, the process of making meaning is also an experience in and of itself and, in communities, this experience is an essential part of the practice.

For the graduate student community of practice, then, experience and social interpretation combine to essentially define the practice of being a student. This is a constant process, however,
so what defines the practice of being a student today may be subtly—or substantially—different next year, or ten years from now. As experiences change so does meaning, and collectively a practice can change over time as the community of practice reimagines itself. In approaching practice as meaning from experience and as an experience of making meaning, Wenger was trying to impart the idea that meaning is a process and not a static, easily defined concept.

The three main concepts that Wenger used to describe how meaning manifests within the context of practice are: negotiation of meaning, participation, and reification (Wenger, 1998, p. 52). In this section I use these concepts to examine the behaviors and activities of graduate students to determine how experience is influencing meaning, and vice versa, in the practice of being a graduate student.

**Negotiation of meaning.** For Wenger, negotiation is a term that is intended to “convey a flavor of continuous interaction, of gradual achievement, and of give-and-take” (1998, p. 53). The negotiation of meaning, therefore, is the way in which individuals and communities make sense of their experiences based on past, present, and future understandings. A meaning negotiated today draws upon and perhaps reinterprets a meaning from yesterday, or last year, or as understood by a colleague or described in an artifact of some kind. In other words, how individuals experience the world, and how they interpret that experience, is based on a history of other experiences and interpretations.

In this study the data clearly show that graduate students are negotiating meaning with respect to their experiences as students and their goals of achieving success. They are asking for and receiving advice on academic, administrative, and personal issues. They are creating and sharing artifacts, strategies, and subject expertise. They are collaborating on course content, doctoral program design and structure, and in navigating the process of an academic program.
and an intellectual pursuit. They are engaging in peer mentoring, most often within the same cohort but also across cohorts as more opportunities to ask questions of, and engage with, other cohorts becomes easier. They are gaining confidence, and are finding their individual voices and disciplinary identities, but also the collective identity of their cohort and of the overall community of students. They are experiencing successes, sharing their strategies for producing successful experiences, and are engaged in better overall learning because of that.

The following comments illustrate the range of ways students negotiate meaning in the practice of being a successful student. In the first instance the student actively participates in his peers’ development of research questions and design. His role as a sounding board and peer mentor, and his gift of being able to help winnow a project or a presentation down to its essential parts is important in other students’ understanding of how they convey information about their work and how they structure the presentation of that work so it makes sense to others. This is a give-and-take exercise and is of especial interest because one student is actively engaged in helping provide another student with an experience that is very much focused on negotiating meaning. As the student expressed it:

You care about this person. You hear them. You know them a little bit. And you feel like it's they're going to spend a lot of time on something, and then they're going to not really get there. How can you help them get to their true alignment faster? And in some cases, I was able to say the right thing and ask the right question. And there were other cases where I never did figure it out, and some of those people dropped out of the program. Some of them are not graduating at the same time. And it was very painful to me because I just didn't know what to do. (Circle-0501, personal communication, May 16, 2013)

The second comment is an example of a student seeking out an artifact, in this case a completed and approved IRB proposal, in order to better understand the process and the expectations of the review board as she prepares her own proposal. Imitation or use of concrete
examples like this is a frequent method for learning from one another in the graduate program, particularly with respect to meeting institutional expectations. Other popular requests are for qualifying papers, dissertation proposals, and dissertations; students want to see what a successful product looks like. This is a clear example of how a student uses past understanding and meaning in the form of a reified object, to negotiate new meaning with respect to what she must do in a future action. The student related the anecdote thus:

When I was doing my IRB, someone from cohort five, no, three, let me... She gave me her IRB, so that was very helpful because like then I could see what does an IRB look like. That made a huge difference for me. Without that, I would've been so lost. So, having a sample IRB made a huge difference, and that was through a direct contact with someone in the program. (Circle-0405, personal communication, May 15, 2013)

These two examples of negotiating meaning also demonstrate the related concepts of participation and reification that are discussed in more detail in the following sections. Negotiation of meaning doesn’t happen in a vacuum; it is dependent upon current experience, past practice, and future expectations. The relationships among experiences, artifacts, and individuals back and forth across time comprise the dynamic of a community of practice. Nothing is static, and the negotiation of meaning is an ongoing process.

**Participation.** Participation, simply put, is a way of learning. As Lave and Wenger have described the experience of newcomers to a community of practice, participation involves “…both absorbing and being absorbed in the ‘culture of practice’” (1991, p. 95). Participation, according to Wenger (1998), is both action and connection, personal and social (p. 55-56). This is an important point, because participation by an individual in a community affects both the individual and the community. In other words, they act and have an effect on one another.

Further, as individuals negotiate meaning, they do so “…in the context of [their] forms of membership in various communities” (Wenger, 1998, p. 57). From this point of view,
negotiation of meaning as part of one community is also influenced by the individual’s membership in other communities. Unless a community of practice becomes an echo chamber where no new ideas enter, this idea is critical to understanding how members of a community of practice are able to keep the practice moving forward through response to new ideas and other forms of perturbation to the system (Wenger, 1998).

Students, for example, bring different prior educational experiences as well as current professional experiences with them to the program. Within the program, one cohort may have a different understanding of an academic process than another. The various understandings and experiences, and their impact on the negotiation and renegotiation of meaning as students participate bring out the practice in the graduate student community of practice.

The fact that students are participating is clearly indicated by the data. Although participation does not necessarily require direct interaction between people, the examples here are primarily about interpersonal interactions. Students are actively giving advice, preparing artifacts, and sharing strategies and experiences. They are gathering and meeting with strong intent, spending time together virtually and in person, and listening to each other. Students are bonding with their cohorts and across cohorts, and expressing love and caring well beyond academic encouragement. They are offering and receiving emotional and academic support, reaching out to one another for a wide variety of reasons, and are experiencing a sense of camaraderie. They engage in peer mentoring, as well as imitate one another’s successes. Perhaps most importantly, many students actively work to improve the system, i.e. the community, within which they are practicing. The comments in this section convey a range of participation. The first, for example, is an illustration of one cohort’s deep engagement with each person’s research plans:
We are constantly almost as involved in other people’s research planning as we are in our own. (Interview-0713, personal communication, November 11, 2013)

Given that the Ph.D. program admits individuals from a wide range of backgrounds and with a variety of proposed research plans, students are more able to co-participate in one another’s design processes than in the actual subject matter. Research design, conceptual frameworks, and methodology are points where many students are able to connect with one another when they otherwise might not. The student anecdotes from more than one cohort about working together specifically on research and study plans verifies this point. At least three cohorts indicated that they were involved in group sessions dedicated to planning research or course design, or general academic program planning.

The second quote is representative of participation in the community that is fundamental to ongoing interactions within a given cohort and within the graduate student community of practice as a whole for the length of the program and beyond.

Each cohort represented in this study provided at least one anecdote illustrating the importance of informal gathering and bonding activities when meeting together for colloquia or symposia. Even in cases where close proximity created conflict, when dealt with well, it helped the cohort create stronger bonds. Cohorts that lived together in the dorms at least once, or who were in close proximity and conscientiously shared events like cooking for an extended time during the first year, appear to have stronger personal ties that remain for the duration of the program at a minimum. One student who stepped out of his comfort zone and tried new things as part of his participation in shared activities stated:

We did a lot at Prescott when we got together. At Prescott we did field trips together, we cooked, we always found a way to cook together and that was always a good community building time and we did a number of outside activities. Things that… I come from a pretty conservative business background and I found myself practicing Tai-Chai and involved in a drum circle and meditation and things that I had never done before and all
of those things were instigated by people within the cohort at some point throughout my studies there. (Interview-0401, personal communication, November 30, 2013)

Participation in informal, un-structured time together is thus considered to be extremely important to the overall health and level of future engagement for the community. As noted earlier, some students mentioned specifically that meeting and getting to know one another in person during colloquia helped significantly later, when all communication was mediated in some way by technology (phone, email, Skype, chat, text message, etc.).

Peripheral participation is another key concept in community of practice theory. Participating peripherally may include observation at first, for example, by newcomers to the community, to gain an understanding of the culture and social patterns before jumping in. In some ways peripheral participation is facilitated for students by the program structure. New students meet and bond with their cohort first, and then during their first symposium participate within the wider community by presenting poster sessions. This allows them to contribute to the symposium, showcase their ideas in a non-threatening environment, while also observing moderately experienced students present proposals and the most experienced students present their dissertations.

Facebook, as mentioned earlier in this chapter in the section on student communication, is an excellent venue for peripheral participation. Until Facebook became ubiquitous, enough so that students found one another there and then established cohort groups and a group specifically for Cross Cohort communication, no virtual space existed that facilitated peripheral participation. There was an All Ph.D. site on Moodle, but as many students in the study commented, it was not useful as a communication platform and after students finished their core courses they had no reason to return to Moodle on a regular basis. Facebook, however, for the students who do
participate, allows for a gradual introduction to other students in different cohorts, and provides a foundation for easier engagement during symposia. Some students commented that they already feel that they know each other before they arrive for symposia, and it makes chatting that much easier when they are there.

**Reification.** Reification is closely related to participation and the negotiation of meaning in that it is the attempt to make the abstract concrete, in many cases as a reflection of, or output from, the negotiation of meaning. Although Wenger used reification to signify an entire range of processes (1998, p. 59), it is most easily understood as the way in which experience and meaning are given form through “…objects that congeal this experience into ‘thingness’” (p. 58). Reification is especially important to understand because it creates “…points of focus around which the negotiation of meaning becomes organized” (Wenger, 1998, p. 58). For example, graduate students create and share checklists, tip sheets, and similar tools that they find to be useful in getting their work completed as students. Tools such as these can be a response to materials students find to be incomplete, such as institutional instructions (e.g., a more complete graduation artifacts list), or to simplify commercial instructions (e.g., an APA style cheat sheet).

Participation and reification are essentially what allows the community to both negotiate meaning and keep track of its history of negotiated meaning and shared learning through memory (from participation) and artifacts (through reification). Again, as negotiation of meaning cannot happen in a vacuum, these memories and artifacts play a significant part in the negotiation and re-negotiation of meaning.

Wenger (1998) offered a warning about reification, and noted that it has the potential to mislead if it is not an accurate or understandable representation of the abstract, or to stifle new development if it is considered to be unchangeable or infallible. With respect to the graduate
student community of practice, the data do not show that anything created has been identified as set in stone yet. As the community matures, however, and artifacts are more easily captured and made available it would be wise for the community to devise a strategy for refreshing its collections or archive so that stale, outdated, or incorrect information is replaced.

Reification definitely occurs among the graduate student community, as the previous examples indicate. Students are asking for example work to imitate and are sharing other types of created artifacts and strategies. They are learning from one another’s successes and imitating those strategies. They are creating and sharing tips, techniques, papers, academic resources and methods. Students are planning retreats and symposia intended to optimize opportunities for sharing research, spending time together across cohorts, and bringing sustainability principles alive. Students are both creating new paths and establishing traditions with respect to being students within this particular program. Stories are a form of reification, and as the program continues to thrive and the students find more ways to connect, be comfortable with one another, and engage in the negotiation of meaning together more stories will develop as well.

The following students capture the essence of reification on two separate scales: internal to, and external from, the community of practice. The first succinctly and exactly describes the importance of reification to the community itself, as an internal structure:

It does make a big difference when we have a past to look at. (Circle-0501, personal communication, May 16, 2013)

As discussed earlier, both participation and reification are the memories and artifacts of the community, and play a significant role in the continued negotiation of meaning. As the graduate student community of practice continues to mature, it will need to develop a way to collect and make available some of the documents and tools that students are creating and
currently sharing primarily through email. Students create and share documents freely as a way to organize and understand their work as students. These tools include calendars, tip sheets, checklists, etc. Students often request examples of dissertation proposals, qualifying papers, and dissertations to use as models and to understand the expectations for their own work; this is the past they like to access, in terms of the student quote above. Lack of a shared archive that students can actively use is currently the biggest gap in the communication structure in terms of supporting a community of practice. Students simply do not use Moodle after the first year, and very few students either posted or found the examples that they were looking for on the All Ph.D. Moodle forum. As mentioned above, once an archive is established, the students will also need to determine how to refresh the content over time or at least tag it in ways that make its age obvious.

In the spring of 2014 the college and several students launched a Digication ePortfolio site specifically for the graduate students. This ePortfolio site, especially if adopted widely by the students, will advance the organization of student dissertation proposals, qualifying papers, and other works that are commonly requested. It makes the example materials available on a many-to-many basis, rather than the one-to-one by request basis that functions now. The contents of the ePortfolio will age in ways that are obvious to the users and, at any rate, will likely contain only works that have been completed and as examples will retain their value over time. Unless students produce high-quality tip sheets, however, these other types of artifacts are unlikely to be located in the ePortfolio system and will still require an accessible location.

One far-reaching cohort project was the establishment of the Journal of Sustainability Education, which was acknowledged by a student in a more recent cohort:
Providing a resource—specifically an academic forum for sustainability education practitioners—was the goal of the students in Cohort 3 in obtaining support from the college for the creation of the journal. This is a good example of a space for reification that also encourages and supports participation. As mentioned earlier, even though I am addressing the different aspects and characteristics of community of practice separately, they are all intertwined. The exchange between participation and reification especially, as Wenger wrote, is what “…makes people and things what they are” (1998, p. 70). The creation and ongoing management and operation of the journal relies heavily on graduate students, and the publication itself invites contributions from the graduate student community in the form of articles, reviews, or guest editorships. The ongoing management of the journal draws upon suggestions from the community at large during special vision and planning sessions during each Spring Symposia. In this example using the journal, the reification supports students in finding their scholarly legs, so to speak, as editors and authors and helps introduce them into the larger community of sustainability educators and practitioners. It serves as a model of a successful achievement born within the graduate student community, as well as a space for continued participation and reification in the field of sustainability education.

Community

The section above addressed practice in terms of the meaning in experience, with examples from the data that show the practice of being a graduate student. Described another way, this practice is the negotiation of meaning of the experience of being a graduate student.
Once practice was associated with meaning in Wenger’s model, he went on to link practice with community by focusing on three specific properties of a practice that help hold the community together, and I shall do the same in this section. These properties include mutual engagement, a joint enterprise, and a shared repertoire. It is this association of practice and community via these properties that “…defines a special type of community - the community of practice” (Wenger, 1998, p. 72).

A task force or a team or a group of people simply related by some common characteristic is not the defining feature of a community of practice. It is when the members of the community are mutually engaged in “…actions whose meanings they negotiate with one another” that they are operating as a community of practice (Wenger, 1998, p. 73). It is essential that multiple opportunities for mutual engagement occur and that members are included in what matters, for a community of practice to exist. Wenger referred to the work of “community maintenance” as an integral part of a practice in order keep the community together (1998, p. 74). In the case of the graduate student community of practice, the college initiates community facilitation and instigates some of the work of community maintenance, but the students are responsible for keeping up with the work itself. The college, for example, requires attendance at colloquia and symposia but tasks students with the majority of the planning and outreach within the community of practice. This approach allows the student practice to direct the development of the community without prescribing how it does so. A more complete discussion of the students’ mutual engagement with examples from the data is found below.

The second property upon which practice and community are associated is a joint enterprise. Communities of practice generally form in response to some type of need or special situation. Through mutual engagement, members must negotiate a response to their situation.
This process results in the defining of a joint enterprise, which, because it is mutually negotiated, also includes relationships of mutual accountability. This accountability can be to each other as members, but primarily refers to the relationship of the members to the enterprise as a form of accountability (Wenger, 1998, p. 81-82).

The third property used to associate practice and community is a shared repertoire. As Wenger described this, “over time, the joint pursuit of an enterprise creates resources for negotiating meaning” and that what these resources have in common is the fact that they “belong to the practice of a community pursuing an enterprise” (1998, p. 82). Earlier I described the importance of participation and reification to a practice. The shared repertoire of a practice “combines both reificative and participative aspects” (Wenger, 1998, p. 83) and thus provides the resources needed for negotiation of meaning.

In the sections that follow I use these three properties of practice—mutual engagement, a joint enterprise, and a shared repertoire—to show how graduate students are building and holding together their community of practice.

**Mutual engagement.** Mutual engagement is a defining property of a community of practice. It is the collective work of the members in negotiating the meaning of the actions in which they are engaged (Wenger, 1998, p. 73). Fostering mutual engagement requires community maintenance, which is the work that facilitates inclusion and commitment of members.

Mutual engagement also requires diversity and mutual relationships. Diversity is essential to continued learning and growth of the community. Diversity in skills, background, communication styles, and so forth contributes to the dynamics of negotiating meaning. With respect to the graduate students, for example, a wide variety of academic and professional
backgrounds are represented, and as the program matures the level of cultural and ethnic diversity has increased as well. Differences in opinions and understandings, for example, allows for more active discussions and conflict, when handled skillfully, can result in positive changes or outcomes for the community.

Mutual relationships are smaller, more tightly held relationships within the community. All members of the community cannot be equally bonded to all other members of the community. In this research I find that the smaller groups, provided there is enough overlap among groups, are really the glue that hold the entire community together. Two or three students work though a problem or achieve some breakthrough and either share their efforts with everyone or, more commonly, one of them shares it with another small group and so on. These smaller groups, generally dyads or triads, commonly form during the first year of the program and persist for a variety of reasons. In many cases more personal connections grow as well, and often these are the connections that provide the emotional support some students need. This access to emotional support is especially important when life events such as illnesses, births, divorces, and job changes affect students’ performance academically.

The graduate students in this community are without question mutually engaged. They work together to understand not only the context but also the process of succeeding within their academic program. Stories are shared, for example, about strategies for making one’s entire course work feed into the dissertation research and writing, how to choose and interact with mentors, and how to balance life and work and school. Students collaborate on courses, engage in course and program planning sessions, create and share lists of required academic artifacts and calendars, and stay in contact in order to support one another. They work together not only to
make sense of their role as students in this program but also as scholars in the wider field of sustainability education. One type of mutual engagement is captured quite well by one student:

I really feel like there's, there's a sense that every...that not only can I offer something, but that somehow, we've been able to build a culture of doing that for each other. That, you know, if I'm overwhelmed and there's a group paper that's being written, somebody else can take a little bit more of a lead. I'll do the same thing, you know, at a different time. (Circle-0707, personal communication, May 16, 2013)

This describes the development of a culture of support that has a give-and-take dynamic. While at first glance this seems to be primarily academic support, it is in fact a form of emotional support as well. Students collaborate on creating a product, for example, but are willing to share burdens in different ways depending on each other’s needs. Several anecdotes in the data demonstrate students stepping in to help a peer who is overwhelmed. Students divide the work on a paper differently, as in the quote above, or they edit another’s paper and rewrite a section, or help craft an email to a mentor to establish clearer expectations for completion of a course. In some respects, this is about students having one another’s backs, so to speak, while they are navigating the various processes and workloads involved in their academic endeavors.

Another type of mutual engagement is illustrated by the next example, which is one of many that emphasized the importance of regular contact among students throughout the course of the program.

…every other week or every three-week phone group advisee conference calls. I get a lot out of those even if it’s not like just informational stuff. But just hearing people talk about what they are balancing. (Interview-0804, personal communication, September 12, 2013)

Regular check-ins of any type—and there are several different types used by students—are part of the work of community maintenance. In many instances, especially in the first year, these are arranged and mandated by the program as cohort check-in calls. While there are some
criticisms of cohort check-in calls, the group advisee and shared seminar course check-ins are mentioned by students as being extremely valuable. Cohort check-ins are regular conference calls or virtual sessions for the cohort to meet together and maintain a sense of connection in between face-to-face colloquia and symposia. The criticism of cohort calls is that they are often a difficult place to have a conversation or, if there is a conversation, to get a word in edge-wise. As a quick round robin check-in, a cohort call is fine for maintaining contact, as long as it is convenient and not impinging on other tasks such as a student’s regular work schedule. As one student expressed:

Like we'd have monthly call-ins for our cohort, but I mean, they were more just to hear what everyone was doing. For me, that wasn't really a time where I got the sort of one-on-one from people, cohort support. You know, I mean it was there, but it wasn't... It's not... It wasn't in the same depth. (Circle-0507, personal communication, May 14, 2013)

Although there was criticism of cohort calls, if a cohort was strongly inclined to meet and had a core group that participated regularly in the calls, there was still the same kind of benefit other students commented on having in smaller advisee calls. One student from an early cohort summed the experience up as follows:

Quite often all of us would say that those conversations reenergized us to continue our work and continue our research and to move on. You know and it was there was something about it to know that you are not alone. The things that you are struggling with, balancing family and work obligations and school obligations all at the same time. We were all in the same boat in many ways and just the opportunity to get together and commiserate and understand that you are not as behind as you thought you were and you are in good company when you are behind and you know that that was good or that you might remain silent in some of those conversations and go I’ve really got to catch up. So there - it was motivating. (Interview-0401, personal communication, November 30, 2013)

The same student spoke at length about the importance of regular calls. For his group, it was a student-directed endeavor and as individuals they were very dedicated to being on the calls - for themselves and for each other. If a student could not attend a call, he or she would send a summary via email to the rest of the group letting them know about her progress. This student
felt that the calls were motivating, especially since he didn’t want to have to call in with nothing to report:

The regularly scheduled - we had scheduled cohort meetings every second week on a Sunday. I don’t know what you want to call it as irresponsible, immature or whatever that notion is or not rational it is there was - I always felt pressured to have something to report. I didn’t want to get on that phone call and say I haven’t done anything since the last time that we talked. So there was always that thought in my head of I really need to have something accomplished before this call comes up so I think that was important in the help as well. So that was something our cohort decided on was to have those meetings on that frequency. (Interview-0401, personal communication, November 30, 2013)

He also thought that the few students who did not participate regularly in these calls did not finish the program, but it was not possible for me to verify this.

Group advisee calls, based on student comments, are more conversational and productive since there is a smaller number of people on the phone, which provides the opportunity to share academic and personal stories and concerns. Beginning with Cohort 6 there are now one-credit shared seminar courses that primarily provide a formal structure for students to maintain contact with one another in years 2 through 4 after the core courses end. The vast majority of students who mentioned being part of these shared seminars found them to be essential. It was especially important for one student, who clearly described the importance when making the transition from the first to the second year in the program:

The transition between the first year and the second year was really dramatic for me because we went from all these really intense online discussions, phone calls, da da da da, very cohort oriented to okay, now you're on your own. It was like whoa. And it was very kind of unsettling. And having that one-credit thing, that just kept me...okay, I am part of something bigger. It's not just me out here all by myself working on this. And that was very, very important for me. (Circle-0601, personal communication, May 16, 2013)
On the other hand, shared credit-bearing seminar courses are not necessary for all students to feel like part of their community, and mandating such courses may lead to the frustration related by one student:

What was frustrating about the one-credit thing was I had so much other things I needed to do and want to do that I didn't... First of all, I was frustrated with this imposition, as I felt it, of a one-credit framework on something that I'm going to do anyway. I have no problem calling my classmates, and we share papers all the time, even though we're not...we don't have have a struc...I don't...I'm not part of the structure to do that, but we just naturally trade papers anyway. And so, all of the functions that you're talking about are still happening for me, but it's just not in that framework of the one-credit. (Circle-0707, personal communication, May 16, 2013)

One final note illustrating the importance of regular contact for students: one cohort struggled tremendously with technology for their calls. The calls themselves were so important, however, that the cohort scheduled them in such a way as to have an entire hour just to work out the technology issues so that they could then engage in the hour-long conversational call:

we used I think five or six different [technology solutions for cohort check-ins] and there was always a level of frustration with the meeting technology. We would schedule a meeting for two hours knowing that sometimes the first hour would be wasted just trying to get people in. (Interview-0401, personal communication, November 30, 2013)

As can be seen from the examples, communication among most students on a regular basis is a critical component to reducing isolation, increasing motivation, and maintaining engagement throughout the course of the program. As with the development of the community of practice itself, though, the communication strategies should emerge from the students’ preferences and not be mandated across the board by the program.

Joint enterprise. The joint enterprise is what, through mutual engagement and negotiation of a response to the situation, the community has determined the members do. In the case of the students, the enterprise is how they develop as students in this particular program, and how they create or come to understand the meaning in their experiences of being students. They
must also move beyond being just a student into the negotiation of becoming a successful student. Student are discovering and sharing with each other all of the aspects and skills and grit that it takes for the individual to not only make it through an administrative and academic journey, but to do so while at the same time achieving their own measure if success.

The data show that students are clearly negotiating a joint enterprise. They are engaged in helping themselves and one another make the most out of their Prescott College experience. Because the students are shaping their own practice (see Wenger, 1998, p. 80), they are establishing their own level(s) of mutual accountability (see Wenger, 1998, p. 80). The institution provides some facilitation of community building intentionally, and in instances where the institution does not provide needed support or resources the students negotiate or create their own sets of resources.

As noted in the section on mutual engagement and mutual relationships, students naturally gravitate to smaller groups and work together in various combinations of dyads and triads for a variety of reasons such as project collaboration, methods or conceptual framework development, and general friendship and support. Connections between and across these smaller groups and their parent cohorts, and then across cohorts, help connect, build upon, imitate, improve, and change the dynamics of the overall system. Working through research questions, administrative requirements, angst, successes and frustrations in an atmosphere of support, problem solving, and solution sharing is the negotiation of their joint enterprise. Most students rely on one another as part of this process. They are mutually accountable for each other and, as such, are accountable to the overall practice of being a successful student as well.

Two students provide details about how students work though a common problem related to their job (i.e., the practice) of being a student, either individually or together, and then share
the results widely so that others can benefit. This includes all aspects of student work, from piecing together administrative requirements, to helping one another stay on track with rigorous schedules, to getting feedback on produced content:

I’m a little bit ahead of the game because I’ve been taking credit through the summer. And so, I just sat down with a bunch of our cohort last night at dinner and went through my spreadsheet and the game plan for the next couple of years. And they were struggling with how to shape their practicum and where that fits and then how that fits with the dissertation proposal and all of those pieces. And so, I’ve had to work some of those things out a little bit ahead of the game. And so, I was able to talk about that with them and help them out. And I would also just add I feel like the whole cohort has helped each other out at some point in the two years we’ve been together. There’s always been somebody a little bit ahead of the game, who can say on Facebook this is what you need to do, or heads up, this happened to me, you better look out for this… (Circle-0707, personal communication, May 16, 2013)

Often accountability is also part of the shared process of helping one another maintain progress and stay on track academically. This can be through shared or similar deadlines as well as through feedback on academic work product such as papers and dissertation chapters. Even though these students did not share a calendar, their individual deadlines were parallel enough to help them keep pace with one another:

Our relationship was not one of setting [a calendar] together by any means, no. She set her own deadlines, I set my own deadlines. It turned out along the way that we were following a very similar - it turned especially as you are near the end you realize who is still in the race for that on-time completion - but no we did not set them together. It was really just through communication and what we were doing and “hey, I’ve got this done what do you think?” We sent - a lot of the work that we did individually we sent to our entire cohort or the majority of our cohort to get people’s feedback. (Interview-0401, personal communication, November 30, 2013)

Stories like these—addressing ways in which students interpret what they are required to do for school and then share their understanding with others—were provided frequently during anecdote circles and interviews. In many cases, an individual’s understanding is reified in the
form of a tool such as a spreadsheet or checklist, or as a message sent via email or posted to Facebook.

**Shared repertoire.** As noted earlier, “over time, the joint pursuit of an enterprise creates resources for negotiating meaning” and that what these resources have in common is the fact that they “…belong to the practice of a community pursuing an enterprise” (Wenger, 1998, p. 82). This collection of resources, which can range from artifacts to traditions, makes up the shared repertoire of the community of practice.

Students have negotiated spaces for communicating with one another as individuals, small groups, cohorts, and across cohorts as the entire Ph.D. community. Students work together dynamically to solve problems or remove barriers and also to celebrate successes. Useful artifacts are distributed freely, but not yet archived in a single, easily accessible location. As one student reflected, the Ph.D. Resources website is really about materials the college requires and not resources for the student to better make sense of his or her experience.

The tone of the community is one of non-violent communication and is respectful even when disagreement occurs. Sustainability mores – equity, social justice, and ecological principles – are reflected in the personal and interpersonal interactions that take place. In terms of joining the larger community of sustainability educators, students learn the history, structures, and ideals of sustainability as ecology, economics, equity, and education via the core courses. The overall habit of the community of practice is democratic; students generally consult one another when they wish to make or inspire a change in the system that affects everyone. The variety in the shared repertoire is illustrated by the differences in the following comments. The first is representative of an approach taken by students who want to broaden their own experiences through deliberate interactions with others while engaged in the program. One student who
believes that success is partially measured by connecting with new colleagues as part of this program. He advises that students interact with as many different people as possible to build their network. Another student who is thoroughly enjoying the inter- and trans-disciplinary nature of the program appreciates working with others in order to better understand how what they do with respect to sustainability connects with what he does. He feels, in fact, that the more holistic perspective that these interactions makes him a better teacher when he is in his own classroom.

You know what's been interesting is that we have been pretty good as a cohort about consciously shaking up who we're working, with the exception of a couple people who just really like to work together. I got to work with a bunch of people, and each time you're working with someone that's different, you kind of come to the table with different skills because those are...work better in that environment kind of thing. (Circle-0808, personal communication, May 15, 2013)

The next comment illustrates clearly how the program, through the core faculty and early coursework, instills particular values in the student community by taking deliberate action. The core courses themselves, in fact, lay the combined sustainability and educational foundation that the students continue to work from for the remainder of the program. Core courses not only affect students’ subject-specific research, but also influence how students negotiate meaning in their experience as students. In these instances, some of the community’s shared repertoire originates in, or is at the very least influenced by, the academic program:

We heard stories of other cohorts that maybe had people that were disruptive or had strong opinions and certainly people in our cohort had strong opinions, but they expressed them in respectful ways and people that had differing opinions expressed those in respectful ways. And I think our mentors [the core faculty] really set the stage for that in probably our first class, probably within the first fifteen minutes of our first class, that that was an expectation that was going to be held to. So it was never an issue for us. (Interview-0401, personal communication, November 30, 2013)

One part of the shared repertoire, which might be critical to the survival of the community of practice, is an ongoing dedication to reach across cohort boundaries to
communicate. One student from an early cohort described the conscientiousness with which they decided to reach out to other cohorts:

We talked about [being welcoming to other cohorts] actually, that we wanted to do that. Because we felt like we hadn’t had that across the board from people in the earlier cohorts. Not that we were angry with them, but we just didn’t think that was really happening yet. And we really wanted to make that happen, so I think some -- we even designed a session where we were all together at one of the colloquia that was early on to try and make that happen and the breakfast things and stuff. (Interview-0302, personal communication, September 13, 2013)

Students in more recent cohorts are deliberately carrying out this tradition as well:

I’ve spent time with people from other cohorts that are behind us, mentoring them and giving advice on how to best find a mentor, how to make your courses feed into your dissertation, how to do this, how to do that, how to do your qualifying paper. I found myself giving a lot of advice to people in other cohorts, and they were very thankful to have that advice and used it. Many of them used it and have sent me emails saying thank you, that was really great advice. So, I think that cross cohort connection needs to be fostered and not just a social setting, but in a way that [is formal]. (Circle-0501, personal communication, May 14, 2013)

The students in the community of practice are engaged in a variety of communication patterns and habits, and are developing strategies and reifying their work in many ways, all of which contribute to the shared repertoire of the group.

Learning

Wenger (1998) wrote that the negotiation of meaning takes place over time, and that the development of practice subsequently takes time as well (p. 86). His ultimate point is that this temporal dimension is not simply a function of time, but rather a function of whether the community sustains “enough mutual engagement in pursuing an enterprise together to share some significant learning” and he further explains that, “from this perspective, communities of practice can be thought of as shared histories of learning” (Wenger, 1998, p. 86).
**Shared histories of learning.** Shared histories in a community arise from a combination of participation and reification over time. Learning takes place when meaning is negotiated from these histories. Communities of practice that persist over time continually learn through the renegotiation of what is known as part of the negotiation of meaning in what is new—particularly when new members are included in the community of practice. As Wenger (1998) wrote, “practices evolve as shared histories of learning. History in this sense is neither merely a personal or collective experience nor just a set of enduring artifacts and institutions, but a combination of participation and reification intertwined over time” (p. 87).

In the case of a community of practice for graduate students, it must find an intergenerational rhythm and flow that will sustain it over an extended period of time in order to benefit a consistent stream of students progressing through a program. While a community of practice does not require a fixed membership, it does need to support enough inter-generational contact and interaction to pass along its shared repertoire, even as that repertoire changes over time. One critique I have of most applications of community of practice in higher education is that they rarely address a temporal or continual learning dimension. This is understandable when using community of practice theory to improve classroom or course-specific learning, as it would be very difficult to maintain a community of practice after the end of the course.

In the case of this research, however, the question really is about whether students can continue to benefit from each other over time, especially through the co-creation and sharing of knowledge across generations, so that an entire academic program becomes more effective and a larger number of students persist and achieve their own measures of success. There are instances when a bona fide community of practice may form and disband quickly, and so there is no specific time frame one can use to define a community of practice (Wenger, 1998, p. 86).
Wenger indicated that the temporality of communities of practice “is a matter of sustaining enough mutual engagement in pursuing an enterprise together to share some significant learning. …[And that] communities of practice can be thought of as shared histories of learning” (1998, p. 86).

Because the community of practice revealed by this research is relatively new, the findings show only the beginning of shared histories; however this might also predict that this development will continue along the same trajectory. There is an important balance between participation and reification that must be maintained to enable a community of practice to continue to learn effectively over time. If nothing is reified then there are no artifacts or material to allow past negotiation of meaning to influence current practice. Similarly, if there is not enough participation then the value of “shared experience and interactive negotiation” is weakened and there “may not be enough overlap in participation to recover a coordinated, relevant, or generative meaning” (Wenger, 1998, p. 65).

This sense of balance is important also in terms of intergenerational interaction. Reification is important for generating resources that can be shared over time, while participation by multiple generations simultaneously aids in the interpretation and use of reified artifacts and behaviors based in the communities shared repertoire. One instance of an early cohort student’s frustration with a lack of example work to review shows the importance of having some reified objects available, such as sample dissertations (across cohorts as well):

I really had...no clue what an education dissertation [was] supposed to look like or what it [was]. Now, I have a better idea of it. So, one thing, in terms of getting support and mentorship is just to have examples of this is what an education dissertation is. I had no idea. And I think that was a big frustration for me. (Circle-0405, personal communication, May 15, 2013)
Participation is also important, as simply looking to past work is insufficient in helping to understand how that work came to be and what was involved in putting it together. Several students, including myself, got together and did a presentation on research methods and methodology at a Spring Symposium. A member of another cohort made the following remarks about our presentation, indicating that it was helpful to hear the differences explained by other students. In part:

That session… that session you, you guys did on methods was way helpful for me because honestly, I did not learn anything from my methods classes in my first year. I, I was so confused. I didn't understand the difference between research design, research framework, data gathering. I had no idea. I had no clue. (Circle-0405, personal communication, May 15, 2013)

The data in this study suggest that a series of events and changes in the ways student interact and communicate are helping to create a healthy balance that is speeding up the development of a community of practice among graduate students. There are also differences in the types of presentations offered at the symposia, where students are learning from one another’s experiences in addition to hearing about each other’s research. There is also more time built in to the symposia, deliberately and in direct response to student feedback, so that opportunities for mingling and especially cross cohort interactions are increased. As one student commented, in speaking about the importance of making connections during informal downtime at the colloquia or symposia, that Facebook interaction has a similar effect as other kinds of informal connections:

I did notice a difference, though, even in that Prescott cross cohort Facebook page. I mean, because for me, I'm moving for the seventh time in two years. You know, fourth job. I just started regularly checking in on that site, and I felt like immediate love and support from people that now, I feel like I know them, even though they're in different cohorts and I haven't spent much time in person with them. Maybe because I just gave a lot of myself on that social platform. I don't know. So maybe in giving more of yourself, you get more in return… (Circle-0507, personal communication, May 14, 2013)
There was no participation in this study from Cohorts 1 or 2, so it is difficult to know if any shared histories originated with those cohorts. Students in Cohort 3, however, made a conscious decision to deliberately reach out to newer cohorts, as seen in the first student comment at the beginning of this section. Their personal outreach to new students, and their symposia design that specifically encouraged cross cohort communication, was a key turning point in the program for the possible development of a graduate student community of practice. Their initiation of the Journal of Sustainability Education project was also instrumental in increasing cross cohort participation. The journal planning discussions at the symposia were cross-generational by design, and the managerial work on the journal relies on students from various cohorts. As a continuing resource, the journal encourages ongoing participation by current students, alumni, and the wider sustainability education community.

Another important change is the growing use of Facebook as a communication tool for students. The impact is obvious from the second student comment above, which is representative of several that student participants shared about Facebook. The use of Facebook is a reflection of its general popularity and wide use as a communication tool. At this point enough people use it so that a critical mass of students have found and are engaged with each other on the Facebook platform. A cross cohort group was formed, and individual cohorts maintain their own private groups. New cohorts are setting up Facebook groups and meeting and getting to know one another online prior to their first colloquia. Students in the cross cohort group are exposed to one another before meeting at symposia, and some are more familiar with each other as they keep track of events in each other’s lives as friends on Facebook.

The need for a better networking and communication platform beyond Moodle and email was known as early as 2010. A Cohort 4 student tried to establish a social networking site using
the Ning platform for students but participation was lacking. Luckily, the general popularity of Facebook was rising at the same time Ning became a commercial platform. Students were already gravitating to Facebook when the effort to create a Ning site ended. There are still several students who do not participate in social networking, but enough are in that virtual space to make a difference in the connections and communication patterns of the graduate student community of practice, particularly with respect to the availability of cross cohort communication.

As mentioned earlier in the chapter, another recent development is the establishment of the Digication ePortfolio platform for students. If this becomes popular with students then it will provide a good archive for the example materials most often requested by students: successful qualifying papers and dissertation proposals, etc. An archive of materials such as Digication can help maintain a balance between reification and participation.

Moving forward, as the community of practice continues to mature, the ways in which members generate and capture shared histories of learning will gain traction and become part of the shared repertoire. Currently several different online tools are used for communication and artifact sharing, and formal, structured gatherings take place during colloquia and symposia. Informal meetings occur also, online and in person, where negotiation of meaning takes place. Learning occurs constantly, and as the community of practice matures and gains new members, there is a better balance between reification and participation over time, provided enough opportunities are available for intergenerational interactions and the students take advantage of those opportunities.
Findings Discussion

In this chapter I have presented selected results from the research data, first to set the context for the participants’ responses by briefly describing their characteristics and aggregate definition of success. I then described and discussed the importance of clear and useful communications methods as essential to the formation and long-term integrity of a community of practice. Inspired by Wenger, White, and Smith’s 2009 digital habitats concept, I discussed the preferred communication methods of the students and described at length the importance of social media to the growth of this new community of practice among the graduate students.

I then used the remainder of the chapter to illustrate with representative exemplars how the student community is meeting each of Wenger’s (1998) characteristics of a community of practice in order to prove that one has in fact begun to form among the doctoral students at Prescott College.

Given, then, that I’ve shown that a community of practice exists among the students, I now discuss how this data address the original questions for this research.

The primary question "Does a community of practice develop?" has been answered affirmatively. A community of practice as measured according to Wenger’s characteristics has developed. Students are both finding and developing meaning from their experiences as students, and are engaged together in a journey to understand and help improve their practice of being successful students. They are, as a community, creating a shared history of negotiated meaning and through cycles of cross cohort (i.e., intergenerational) communication, the community continues to learn and sustain itself.

Another question “How is it sustained?” is illustrated as well. The initial growth of the community reflects the behavior and characteristics that will sustain it over time. The college
provides some initial structure that suggests and then facilitates movement of the community
toward becoming a community of practice by bringing students together for in-person meetings
during colloquia and symposia, as well as by providing the foundation for work and research in
sustainability education through core courses and assignments.

Previously I chunked other guiding questions into four larger contextual categories:
achievement; cross cohort communication; physical, virtual, and intellectual opportunities for
sharing; and temporal context. I address each of these briefly and then summarize the relevant
answers in Table 22.

**Achievement.** The guiding question that speaks to achievement was:

- Does the information and knowledge being shared in stories help individual students to
  complete their work effectively, moving smoothly through a trajectory from novice to
  experienced graduate student or researcher?

The data indicate that yes, this knowledge sharing is happening, but is in very early stages. As
more artifacts representing student work, such as qualifying papers and dissertations, are
developed and shared, newer students have past work to model and to help them understand their
roles as students. Shared understanding also helps them set their own expectations as well as gain
insight into what others will expect of them. As students negotiate meaning, they create the
strategies, artifacts, and habits that shape their communal understanding of the process. This
shared negotiation of meaning also helps them adapt the process itself, as they respond to it and
change it collectively. Students are increasingly teaching one another what they learn about the
common elements of the program, such as research methodologies, and provide opportunities for
better learning to occur.
Cross cohort communication. The questions that most directly guided this research to look into cross cohort communication included:

- Do robust communities of practice exist and/or develop within and between cohorts?
- How do subgroups connect across cohorts in effective, meaningful ways? For example, by discipline, topic, shared interests, etc.

Briefly, small groups of collaborators and colleagues do indeed exist, but no truly robust, cross cohort communities of practice yet. The minimal cross cohort relationships that do exist are critical to sustaining the community of practice over time and must be strengthened.

Subgroups are connecting in meaningful ways, through shared seminars with students from other cohorts, through cooperation on planning events such as the symposia, and via technology such as Facebook. Cross cohort connections that are centered on shared aspects of research, such as methods, do exist, but they are weak. For example, they may occur and persist for a short time when newer students ask symposia presenters about their research philosophy or design, but fade once the answers have been obtained.

Physical, virtual, and intellectual opportunities for sharing. The relevant questions about opportunities for sharing included:

- Where and how are stories being shared?
- Are there enough opportunities for sharing stories?

In this case, the data demonstrate that stories and other exchanges of advice and anecdotes occur in a variety of places, using difference modes of communication. Students value face-to-face interactions, and in-person time is important for building relationships that sustain across other communication formats (such as email, Skype, etc.) Students ask questions and share advice with individuals or small groups via email, call one another on the phone or use Skype to
chat, text message to stay in contact, and use Facebook to communicate with individual cohorts and the wider, cross-cohort community.

Building additional informal gathering time into the symposia provides opportunities and this helps. Engaging across cohorts via Facebook has had the biggest impact on bringing the community together. Within cohorts there seems to be sufficient time for sharing, although perhaps stronger encouragement for living together or participating in more activities together during colloquia would be beneficial in increasing contact. More opportunities for cross cohort collaboration, as well as relationship building, should be promoted. Meeting other cohorts at a shared conference such as AASHE has been mentioned. More mixers for alumni and students at popular conferences should be encouraged.

**Temporal context.** The final overarching category for guiding questions regarded the temporal context. The question and sub-question in this category asked:

- Do stories help to keep a single cohort together over the course of the students’ enrollment? More specifically, what happens to the community of an individual cohort between the second and third year, based on their (storytelling) communication patterns?

This question is only partially answered. The relationships that students build with one another and the corresponding levels of trust, respect, and camaraderie help smooth the way for additional sharing of experiences (i.e., stories) and for students to both reach out for and offer advice to one another. Staying in contact and supporting one another does help with persistence in the program. The answer to the second part of the question, regarding what happens between the second and third year in terms of communication, rests on the relationships built early in the program, on points of shared interest such as methods or research framework, as well as on
friendship. These relationships predict whether students remain in contact and continue to support one another throughout the program.

These questions and the ways they have been answered, in full or in part by this research, are presented in Table 22.
Table 22  
*Findings Based on Initial Guiding Questions*

<table>
<thead>
<tr>
<th>Overall Context</th>
<th>Guiding Questions</th>
<th>Answers</th>
</tr>
</thead>
</table>
| Achievement                     | • Does the information and knowledge being shared in stories help individual students to complete their work effectively, moving smoothly through a trajectory from novice to experienced graduate student or researcher? | • Yes, but the community of practice is in its early stages  
• Artifacts are created and shared  
• Students are teaching one another what they learn about the common elements of the program  
• Opportunities for sharing are required  |
| Cross-cohort communication      | • Do robust communities of practice exist and/or develop within and between cohorts?  
• How do subgroups connect across cohorts in effective, meaningful ways? For example, by discipline, topic, shared interests, etc. | • Small groups of collaborators and colleagues exist  
• No truly robust cross cohort communities of practice exist yet  
• Cross cohort relationships are critical  
• Subgroups are connecting in meaningful ways  
• Some weak, short-lived cross cohort connections exist  |
| Physical, virtual, and intellectual opportunities for sharing | • Where and how are stories being shared?  
• Are there enough opportunities for sharing stories? | • Stories are taking place in a variety of places, using difference modes of communication  
• Informal time at the symposia provides opportunities for sharing  
• Engaging across cohorts via Facebook has had the biggest impact on bringing the community together  
• Within cohorts there seems to be sufficient time for sharing  |
| Temporal context                | • Do stories help to keep a single cohort together over the course of the students’ enrollment? More specifically, what happens to the community of an individual cohort between the second and third year, based on their (storytelling) communication patterns? | • Partially answered.  
• Relationships students build include the trust, respect, and camaraderie required to promote sharing  
• Staying in contact and supporting one another helps with persistence  
• What happens between the second and third years rests on the relationships built early in the program, and on points of shared interest |
The current community of practice is new, but as communication methods become more clearly established and frequently used, and as the shared learning is remembered over time as memories of participation and reified in shared artifacts (including stories), the community has a growing shared history upon which to continue to build. It cannot be stated strongly enough, though, that a robust configuration of communication tools and platforms used by the vast majority of members must continue in order for the community of practice to thrive over time.

This involves especially the mechanisms for increasing cross cohort interactions. Engagement and relationships across cohorts allows for the most effective and efficient sharing of stories and advice and artifacts between the experienced successful students and the novice, newly entered cohorts. Part of the heavy work of community maintenance will always be that which ensures the most opportunities for students to connect across cohorts. Intergenerational communication is not only what keeps the co-creation and sharing of knowledge flowing, but it is also critical for sustaining the community of practice over time and across generations.

When I first embarked on this research, I fully expected the themes of stories exchanged within and across cohorts to be the most important pieces of data about how and why students are successful. However, what I have discovered is that without the opportunities to share time, and thus stories, with one another across cohorts and over time, a community of practice among graduate students would not have developed. I find, for example, that Cohort 3’s intentional decision to reach out to other cohorts and to design cross cohort functions during the symposia to be instrumental in starting the sets of relationships and behaviors that pushed a small snowball of a community into a larger one of practice. I find that students working to overcome the lack of a quick, easy-to-use, and active social media space, combined with a growing, publicly available social media platform that could be leveraged for use by the majority of students, helped
establish a useful and central part of the graduate students’ digital habitat. Most recently, students have organically responded to the need for an archive for student artifacts, and working with the college, set up the Digication ePortfolio system. These, and future efforts like these, will help the community of practice continue to develop its practice by enabling contemporary communication negotiate meaning through use of shared histories.
Chapter 5: Concluding Remarks

What follows in this chapter is a succinct look at several conclusions from this study, including whether a theory of supported student success has been achieved based on criteria set by Strauss and Corbin (1990). The purpose of this study was to determine if a community of practice had developed among graduate students and, if so, whether it aided them in their endeavors to be successful as students. Using participant observation, one survey, three anecdote circles, and six individual interviews, I collected substantial data from 44 individuals about the graduate student experience, with a specific eye toward ways in which the practice of being a student manifested and whether a community supported that practice. I asked students about types of stories that they shared, and when and where they shared them, to determine if they were supporting each other and if so, if there were specific areas that required the most support.

A community of practice can support students, and several critical factors for student success were identified:

- Face-to-face interactions early in the program smooth the way for more frequent and effective virtual communication later.
- Participation in informal, unstructured time together during residencies is important to the overall health and level of future engagement of students, including across cohorts.
- Accountability routines help students stay motivated and persist in the program. These include strategies such as formal and informal check-ins, buddy systems such as Write & Skype sessions or shared calendars, and shared processes for staying on track academically.
- Small groups, and the overlap between groups, hold the entire community together. Close bonds between small groups of students help individuals achieve goals and persist
through the program, and information and strategies shared among groups helps the entire community move forward.

- Virtual spaces such as social media sites can facilitate peripheral participation early in the program, making the enculturation process for new students easier. Social media and virtual interactions can also deepen face-to-face interactions during residencies, particularly among new acquaintances.

- When students feel supported by the community they sustain their motivation, reduce their isolation, build confidence, and persist through the program.

- Having a past to look at is critical, and as students share resources and example work it helps clarify expectations and improves new work product.

An emergent finding from this study is that when a community of practice first forms, the opportunities for students to share, especially across cohorts, are fundamentally important to the development of that community. Stories and the content of stories are important, but without the places and spaces to share them widely, they remain the domain of just a few individuals. Without opportunities for students to connect and bond, the power of stories to help them navigate from novice to experienced and successful student is diluted by a community system that is too weak to sustain connections—especially intergenerational connections—significantly enough for a community of practice to develop.

The overall goal of this study was, if possible, to generate a theory of supported student success to inform graduate program development in ways that will help nurture students in their role or becoming and being successful as students. This goal has been achieved, as this study has shown that a community of practice can develop among graduate students and help them achieve success, and further has identified points in the development process where institutions can
provide facilitation, encouragement, and resources. Of particular importance is the recognition of the importance of social microclimates, especially those where cohorts mix and meet and connections are created and relationships built.

Four major conclusions from this study are presented below in a logical sequence that helps highlight how they build upon each other. Following the conclusions is a brief set of recommendations and suggestions for further research.

**Conclusion 1: A community of practice is possible and beneficial**

It is possible for a community of practice to develop among graduate students that supports them in their practice of becoming and being successful students. In this particular study, the students were enrolled in a hybrid educational delivery model, which mixed a low-residency requirement with online learning and self-directed study. As discussed in the previous chapter, and following Wenger’s (1998) description of the meaning, community, and learning characteristics of a community of practice, the students have organically grown into a community focused on the practice of being a successful student. The benefit of the community as a whole, one that is welcoming and responsive and focused on helping each other succeed is summed up nicely in one student’s comments during an anecdote circle. She discussed the feeling of belonging combined with support from the community as a whole, and said:

> And I think that continued support and reminder from faculty and students across cohorts, you know, by the end really helped me to achieve what I was able to achieve. (Circle-0507, personal communication, May 14, 2013)

This student, who had serious concerns that she didn’t belong in graduate school and suffered somewhat from imposter syndrome, felt supported by the community for the entire time that she was in the program. This helped to keep her motivated and her self-confidence intact. This close support gave her the confidence to find within herself a meaningful topic for her research and
overcome her doubts about ability; she was able to conduct research that was relevant and important to her and ultimately achieve her goal of graduating with her Ph.D.

**Conclusion 2: Social microclimates are critical for development of a community of practice**

When coding the data I found many instances where bonding occurred, relationships were initiated and strengthened, and where a sense of supportive camaraderie was shared. In his 1998 model, Wenger discussed the existence and importance of mutual relationships within the characteristic of mutual engagement, and certainly these mutual relationships can be classified as microclimates. However, in the context of this dissertation, the term microclimate indicates a set of characteristics or qualities of a communication space that protects a habitat in which smaller sub-communities can thrive within a larger community of practice. This can be the space in a relationship defined by the level of trust individuals feel and allows them the freedom to communicate frankly and openly. It can be the space of a Facebook group, which allows easy and available access to the individuals who participate. Or it can be the space of shared housing, shared meals, shared courses, or shared activities. The germinal notion is that there are many opportunities and instances where students are engaged with one another inside a communication space that, because of its own particular microclimate, nurtures that mutual relationship and mutual engagement that is critical for the development of a community of practice.

Described another way, most nodes within a system or a network need to be strong and resilient for the overall system to thrive. Nodes with their own nurturing microclimate, for example, have a better chance of developing that strength and resiliency and thus are crucial for the overall ability of the system to thrive.
Conclusion 3: Cross cohort microclimates are critical for sustaining a community of practice

Microclimates that serve as incubators for cross cohort interaction and exchange are critical because it is the cross cohort—i.e., the intergenerational—connections that sustain the community of practice over time. A cohort, for example, really only lasts until its members graduate. For a community of practice for students to be truly beneficial, it must sustain itself over many generations of students. For this to happen there must be meaningful opportunities for students from different cohorts to make strong connections. Stories and advice that are shared from generation to generation are often the most useful, and over time the most refined, as lessons learned in one generation become foundations for new learning in the next. These are available to the community as reified objects, shared memories of participants, and as shared histories of the community. As each set of students cycle out, a new set cycles in and, without cross cohort relationships and regular exchange of information, the knowledge gained by the more experienced students cycles out with them.

Conclusion 4: A theory of supported student success

There are four criteria that measure the applicability of the theory to a phenomenon: fit, understanding, generality, and control (Strauss & Corbin, 1990). In this research I have shown that a community of practice can organically develop among graduate students in a doctoral program that uses a hybrid mode of delivery and that such a community of practice can support the students in their practice of becoming and being successful students. I have further identified as critical the importance of social microclimates to the development of the overall habitat of the community of practice. These microclimates are especially important as incubators for the cross cohort interaction and exchange that is essential for a community of practice to continue to learn
and thrive over any length of meaningful time for student success, meaning that it must sustain across generations. These conclusions faithfully represent what the data illustrate as happening within the graduate student program and corresponding community of practice under study in this research, and thus pass the first criteria for a theory as designated by Strauss and Corbin (1990).

As a theory, this series of interrelated conclusions is easily understood by the students who participated in the research, as well as by educational practitioners in general, thus meeting Strauss’ second criteria of understanding. The data that was collected and analyzed was also sufficiently comprehensive to be representative of the phenomenon of a developing community of practice among graduate students; the interpretation is broad and conceptual, and is abstract enough that it could be applied in a variety of circumstances, thus meeting Strauss’ third criteria of generality.

Finally, this theory could easily be used to guide future actions, either in pinpointing microclimates as a target area for further investigation, or as a place on which to focus efforts on facilitation and support for a developing community of practice, and thus meets Strauss’ fourth criteria of control.

**Recommendations for Institutions**

Communities of practice generate organically, and while an institution can help facilitate or provide resources in support of its development, it cannot mandate a community of practice into being. Institutions should be aware of the characteristics of a community of practice, and pay attention to whether one is developing among its students. Because communities of practice generally arise in response to a need or a situation, institutions that recognize that one is developing (and that it appears to be of benefit to the students) can promote and support the
physical and virtual events and spaces students need to make the strongest connections with one another.

Assuming that they are already making full use of face-to-face class time for students to engage with one another, institutions with hybrid learning models should consider ways to support students in maximizing unstructured time when meeting face-to-face. Have resources available to them that makes it easy for them to congregate during down times, such as group transportation, shared housing, semi-structured group events, etc. Students from different cohorts should specifically be brought into contact with one another as often as possible when face-to-face meetings occur, and cross cohort interactions during unstructured time should be encouraged and supported whenever possible.

Institutions should be responsive to the development of digital habitats for the student community of practice, but only if the tools and platforms they offer can be configured in ways the students need in order to most effectively support their community. Use of social media should be encouraged, especially across cohorts. Whenever possible, students from different cohorts should be able to interact freely with one another across learning management systems but institutions must be prepared to offer an easy-to-use, active, and flexible platform or students may migrate elsewhere. If and when they do, institutions should look at how they provide communication technology support for their programs and re-examine them in light of real student needs.

**Recommendations for Further Research**

The concept of microclimates as critical for the foundation and development of a community of practice needs to be understood in the context of other educational delivery models, especially online only. Research into the creation and use of microclimates, especially
for meaningful cross cohort communication, in online education deserves exploration. Research such as this is important along a continuum looking for new paradigms for interaction in online education. Given that there is no true replacement or analog for the energy and excitement students can feel from face-to-face interactions, how else can institutions foster or capture that energy in online learning?

Another potential area of research is the development of a community of practice as a response to a specific need or set of needs. The question is whether the information gathered can be used for program evaluation and improvement. A deep look at the content of stories shared among students could identify gaps in institutional support for the students, or lead to insights regarding what helps students most in terms of their personal and academic development and persistence in a program. An additional question along this line of inquiry might ask if an institution’s response to student needs interferes with the development of a community of practice.

**Reflections on this Research and its Contribution to Sustainability Education**

The research presented here contributes to the field of sustainability education on a number of different levels. At the very least, it provides practical information about how a specific community of practice has developed in relationship to a particular academic program in sustainability education, and describes ways in which that community of practice supports the success of the students enrolled in that program. If the goal of the academic program is to prepare qualified sustainability educators and ultimately graduate change agents who can go out into the wider world and make a difference, then studying ways to support their success as students helps the program achieve its goal.
Similarly, through this research, the students involved have become aware of characteristics of a community of practice, how communities of practice evolve and serve as living knowledge generators and repositories, and ways in which each individual contributes to, and benefits from, participation in a community of practice. This meta-awareness of the benefits of social, situated learning experiences and their potential for addressing complex issues in collaborative and constructive ways can influence these students’ approaches to teaching, learning, and active engagement in sustainable education in the future. I use the term sustainable education deliberately in this context, in order to highlight the students’ experience of sustainability as a learning process rather than the simply the teaching of a predetermined and defined topic (Sterling, 2001, 2004; Wals & Blewitt, 2010).

At a more abstract level, however, studying communities of practice in higher education can provide insight into how a holistic, transdisciplinary academic program might manifest itself. A student community of practice can be leveraged to emphasize skills that are important for contributing to, and learning in, a social context. Communities of practice, and individual’s role(s) within those communities are non-linear and reflective of a complex network of relationships, activities, and understandings. As such, they are essentially their own ecosystems, and adding a meta-cognitive dimension—where students are aware of themselves within this social learning system within the broader context of higher education—might facilitate the reorientation in educational worldview that will be necessary before a paradigm shift such as Sterling (2001, 2004) promoted can occur.

This research thus contributes to epistemic learning about sustainability and higher education. By addressing how a particular form of social learning, i.e., through communities of practice, promotes success within a higher education context, and by determining that it
increases individual student learning and achievement, this study provides data in support of social learning as an aspect of sustainable education.

Sterling (2004) noted that higher education, and society, can “choose either to strive towards deep learning and reorientation by conscious design, or have it thrust upon us by default, through the effect of mounting crisis” (p. 68). Deep learning and orientation, he argues, requires epistemic learning, which can contribute to a transformative response, i.e., one that fundamentally changes the existing system (Sterling, 2004). This research, although a small drop in a large ocean, makes the choice to strive for deeper learning. It shows qualitatively that community of practice theory applied higher education adds value to the educational experience for students, and is a potential strategy for epistemic learning. Sterling’s (2004) whole systems shift suggests changes in practice, policy, purpose, and paradigm that can shift the entire system from transmissive to transformative (pp. 63-63).

Table 23
Sterling’s Whole Systems Shift and Prescott College’s Graduate Student Community of Practice

<table>
<thead>
<tr>
<th>Sterling</th>
<th>Prescott College Community of Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradigm</td>
<td>Reflects living systems or ecological metaphor</td>
</tr>
<tr>
<td>Purpose</td>
<td>Broader education; no longer simply preparation for economic life</td>
</tr>
<tr>
<td>Policy</td>
<td>Development of potential and capacity; continuous learning</td>
</tr>
<tr>
<td>Practice</td>
<td>Participative, active, social learning; situated learning</td>
</tr>
<tr>
<td></td>
<td>Community of practice reflects systems or ecological metaphor</td>
</tr>
<tr>
<td></td>
<td>Community of practice can facilitate trans- and inter-disciplinary thinking and problem solving; diversity helps de-silo</td>
</tr>
<tr>
<td></td>
<td>Student definition of success reflects this; same group developed a supportive community of practice</td>
</tr>
<tr>
<td></td>
<td>Community of practice is a social learning structure; epitomizes situated learning</td>
</tr>
</tbody>
</table>

Note: Sterling summarizes a whole systems shift as being comprised of “four ‘P’s,” these being practice, policy, purpose, and paradigm. In this scenario, paradigm and purpose are the deepest level that guide policy and practice in higher education. (2004, p. 64)

In Table 23, the community of practice identified in this study is linked to the four areas that must change for a systems shift to occur. In so doing, I show that a small study such as this
can contribute to, as well as reflect, the movement toward transformational learning for individuals and institutions.
References


Cohort learning online in graduate higher education: Constructing knowledge in cyber community. *Educational Technology & Society, 7*(1), 115–127.


Glossary

Appreciative Inquiry: Appreciative inquiry when applied as a method for organizational change is an action-oriented cycle that begins with discovery of the ‘positive core’ competencies and moves on to dream, design, and destiny stages of the cycle. In the context of this research, appreciative inquiry is used to inform how the research design implements a strengths-based rather than deficits-based approach to finding the indicators that are contributing to student success, as opposed to looking only for barriers or problems or other potential deficits in the students’ attainment of success.

Artifact: As we negotiate meaning, we make abstractions more concrete, and create symbols, objects, or habits to represent, codify, or document our learning and understanding. In community of practice theory, a reified object is an artifact. Wenger uses reification as a characteristic of a community of practice and defines it as covering “…a wide range of processes that include making, designing, representing, naming, encoding, and describing, as well as perceiving, interpreting, using, reusing, decoding, and recasting” (Wenger, 1998, p. 59), any of which might result in an artifact.

Cohort: A cohort of students is comprised of students who are admitted in the same admit year and proceed together through an academic program. In the case of the Prescott College Ph.D. program, students are admitted together in the fall and are identified by their cohort number. When students do not graduate with their cohort within the regular four-year time frame they are often informally adopted by the cohort with which they ultimately graduate.

Community: Community generally indicates a group of people who share a common goal, interest, or location. Wenger uses engagement, imagination, and alignment as “modes of belonging” that can be used as a framework to describe different types of communities (Wenger, 1998, p. 181). Throughout this dissertation I use the term community to refer to a group of students who are associated with one another in some way, but who are not necessarily engaged in a community of practice.

Community of Practice: A community of practice is “a community of mutual engagement, a negotiated enterprise, and a repertoire of negotiable resources accumulated over time” (Wenger, 1998, p. 126). It is not the same as a group, team, or network (Wenger, 1998, p.74).

Critical Friends Group: The inspiration in this research for asking interviewees who provides critical correction for them is the Critical Friends Group model from the National School Reform Faculty at the Harmony Education Center in Bloomington, Indiana. Critical Friends Groups are professional learning communities where teachers (K-12 primarily) work together in a directed and trusting environment to improve student learning. Groups of 6 to 12 faculty and administrators commit to meeting regularly and establishing ways to communicate openly and transparently about improving student learning and outcomes. Critical Friends are teachers who can meet and work together to share and critique each other’s work in “an atmosphere of mutual trust and freedom from fear.” See the NSRF website for additional information: http://www.nsrfharmony.org
Cross-cohort communication: Communication between and among cohorts. Stories, advice, and artifacts are shared from one cohort to another. Cross cohort communication is essential for helping novice students learn to become experienced students; it is part of the intergenerational communication and reproduction cycles of the community.

Generation: Communities of practice include cycles of newcomers, novices, and full participants. A community has reproduction cycles through which newcomers move to full participants and are in a position to mentor the new novices. The length of a reproduction cycle, or generation, varies by community. In the case of this graduate student study, a cycle of reproduction is four years. However, I often treat each cohort as a generation in this dissertation because the students go through different stages of the program depending on which year they are in, progressively gaining both more experience and more exposure to older and newer cohorts.

Grounded Theory: A qualitative research design that incorporates a variety of methods to collect and analyze data in order to generate a theory that explains the phenomena under study.

Habitat: “A habitat is…an area that incorporates all the environmental and biological features required for the survival and reproduction of a species” (Wenger, White, & Smith, 2009, p. 37).

Information broker: A person who shares information across technological, organizational, or community borders. A student who shares important Facebook posts with other students who do not participate in Facebook is an information broker. Similarly, a student who actively shares information across cohorts that generally remain separate would be an information broker.

Intergenerational communication: One important aspect of communities of practice is that they support and foster intergenerational communication. Members of communities move from peripheral positions, usually as newcomers to the practice, through novices to experienced members of the community. Communication between novices and experts, between newbies and old-timers, is the intergenerational communication through which knowledge and experiences are shared, and is crucial to the survival and growth of a community of practice.

Learning community: The term learning community is most frequently associated with groups of students sharing coursework and other aspects of their academic experiences together in support of their learning and development. Creating a context for social learning to take place does support student learning, engagement, and ultimately success. A learning community is not necessarily a community of practice.

Legitimate Peripheral Participation: A term coined by Lave and Wenger (1991) to indicate ways in which newcomers transition into and are accepted in a community of practice. According to Wenger (1998), he and Lave wanted to “point out that the required learning [for a newcomer to be included in a community of practice] takes place not so much through the
reification of curriculum as through modified forms of participation that are structured to open
the practice to nonmembers” (p. 100).

Microclimate: In the context of this dissertation, the term microclimate indicates a set of
characteristics or qualities of a communication space that protects a habitat where smaller sub-
communities can thrive within a larger community of practice.

Open-web: Open-web resources are those that are available to anyone for free. Google,
Skype, Facebook are all examples of open-web resources. Moodle is not an open-web resource
since it is provided by the college. Similarly, Basecamp is not an open-web tool because it
requires a subscription by the user.

there are multiple, varied, more- or less-engaged and inclusive ways of being located in the fields
of participation defined by a community. Peripheral participation is about being located in the
social world” (p. 36).

Practice: In this dissertation, the shared practice around which the community of practice
develops and supports is quite simply the “job of being a student.” As Etienne Wenger, Richard
McDermott, and William Snyder defined practice in 2002, “it denotes a set of socially defined
ways of doing things in a specific domain: a set of common approaches and shared standards that
create a basis for action, communication, problem solving, performance, and accountability” (p.
38).

Primacy effect: In surveys, respondents may prefer answers from the top of a list. This is
the opposite of the recency effect, where they prefer to choose from the end of a list.

Student type: Student type in this study is “graduated” or “current.” With a few
exceptions of students who had not finished in the four years, graduated students in this study
were from cohorts 1-4. Current students at the time of the study were those from cohorts 5-8,
with a few from earlier cohorts who were still working on their courses and/or dissertation
research.
Appendix A
Code Tree

12/5/13 Dedoose Codes Export for Project: Student Success

Technology Technologies mentioned as useful or not useful in maintaining community or at least contact with others in the program.

Community of practice HABITAT This code reflects the original research proposal's goal to discover and describe the habitats within which students congregate and communicate. According to Wenger et al (2009) communities require habitats to thrive (p. 38). This code helps identify those habitats, both digital and traditional, in which graduate students' communities of practice thrive.

Microclimate Students create their own habitat - a microclimate - for learning together. Synergy in shared courses is an example.

Communication STRATEGY This code addresses the original research proposal's goal to discover and describe communication strategies among students. Communication STRATEGY although nested within the Technology code does not actually require technology to be used to code an event, strategy, or story within the data.

Digital

Will not use specific technology A few people will not use facebook, for example.

Cannot use/frustrated with technology Some people reported being frustrated with and/or giving up on tools such as Elluminate.

Traditional

Information BROKER Someone who shares information across groups, online systems, people.

Persistence Student's persistence through the program.

Camaraderie Effects of camaraderie on individual persistence. This was a theme explored in the anecdote circles.

Letting go In some instances a person needs to let go of something, for example a mentor who is not working out, in order to be able to continue to move forward.

Internals Affective domain considerations. This code and its children are primarily targeted at students' feelings about what success means, how they are developing as sustainability educators, whether they are experiencing transformational moments, and if validation (particularly external) is important to them.

Identity moment This is reflective of information gathered in the initial survey. A question specifically about identity moments was asked on the survey and in the interviews. An identity moment is one where the person feels in a significant way a sense of themselves as expert in their field or deeply knowledgeable in the subject. This is an internal recognition of themself as an embodiment of knowledge, as compared to external recognition.

Success as defined by the student Code is reflective of information from the initial survey results and followed up on in the interview. This is simply indicative of success as defined by the student.
TRANSFORMATIONAL moment This is reflective of information gathered in the initial survey. A question about transformational moments was asked on the survey. This code is used to indicate moments when transformational learning has taken place and is recognized as such by the student. This is different from identity moments, although some identity moments may in fact be transformational or a recognition that transformation has taken place.

EXTERNAL recognition This is reflective of information gathered in the initial survey. This code is used for instances where external recognition is important to the student. This can include instances where students felt validated in some way by a person or group external to themselves. In this code, external can be external to the community, as well as internal to the school community but external to the student.

Difficulty receiving criticism Someone who finds it difficult to accept criticism, even though they know it is constructive and meant to help them.

Self awareness Something that demonstrates the individual is aware of their own learning styles, personality, and needs and identifies that about themselves.

Voice Finding or using one's voice - sharing one's expertise

IMPOSTER Students who feel like or worry that they don't belong to the group and are imposters; fear that someone will find out they don't belong.

Shy Students who do not want to impose on their mentors or faculty or other students

Confidence

Seeking deeper understanding individuals who identify going through the program in order to deepen their content or intellectual understanding of sustainability or their specific topic

Seeking deeper network Individual recognizes that the experience in the PC program will deepen their network of like-minded individuals. This is slightly different than the code for developing the wider professional network, since that is primarily for the network outside of the PC cohorts

Validation Validation or reinforcement of what the individual already knows, is learning, or is growing into.

Setting Boundaries Being very structured and setting boundaries around work, school, and family in order to be able to keep things in balance.

Mentor experience Ways in which students experienced mentoring within the program. Cultivating effective mentor relationships was a theme explored in the anecdote circles.

AS mentor Student's experience and behavior *as* a mentor

Influenced behavior as STUDENT When a PhD student who is mentoring others, such as MAP students, learns how to be a better student to their own mentors this code can be used.

Influenced or CHANGED behavior

PEER mentoring Mentoring from peers.

Critical Correction – peers Critical correction provided by classmates or students from other cohorts

FINDING mentors Student's experience with, or advice received about, finding mentors.
EDUCATING mentors Student's experience with, or advice received about, best ways to work with mentors. This often means introducing them to the Prescott culture, or setting up the expectations the student has for the mentor.

WITH mentor Student's experience with their mentor. The behavior of a student's mentor. Committee members are considered mentors and are tagged here as well.

INEFFECTIVE relationship Description or example of a relationship with a mentor that is not effective or does not provide much benefit to the student.

EFFECTIVE relationship Description or example of a relationship with a mentor that is effective and beneficial to the student.

Critical Correction – Mentor Critical correction provided by mentors or committee members

BuildingCommunity Actions that are based in the cohort and cross-cohort community and that contribute to the development or cohesion of the community. Participation in community was a theme explored in the anecdote circles.

PARTICIPATION in community Actively contributing to or benefitting from the student community

INTERGENERATIONAL communication From original research proposal questions. This code is used for instances where information clearly is passed across cohorts, or for events when there is opportunity for communication to pass from one cohort to another. Cohorts are considered 'generations' in this research. In some cases PhD students may pass information to students in other academic levels (masters, undergraduate) and that can be a form of intergenerational transfer as well.

INSTITUTIONAL facilitation Ways in which the school facilitates the development of community among students within and across cohorts. This can include the students' organization of the symposium, as they are part of the institution in that capacity.

Contribution of PROGRAM DESIGN to foster community From original research proposal questions. This code is used when it is clear that an element or component of the institutional program was/is designed to contribute to the development or maintenance of community within the student group(s).

Contribution of SHARED COURSEWORK to foster community From original research proposal questions. This code is used when shared coursework contributes to students' sense of community, or works to keep them in contact with one another even if they don't identify it specifically as community.

Imposition The facilitation by the institution is perceived as an imposition rather than help

Documentation Materials provided by Prescott, such as the PhD handbook

CONTRIBUTING to community Actively contributing to the community

Subject expertise Student participated by sharing their subject expertise in order to help colleagues understand concepts, broaden their knowledge, etc. This can also include strategy advice, as opposed to strictly subject expertise.

 Specific STRATEGY Specific example for how to do something, either organize time, accomplish writing goals, educate mentor, etc.

Giving ADVICE Advice shared by the participant

Sharing ARTIFACT Just sharing in a tangible way what you know, have developed, have come to understand. Sharing papers, checklists, etc.

BENEFITTING from community Receiving some help or support from the community
Received ADVICE Advice received and followed with good benefit
Release point IN a meeting or on a check-in call some sort of release happens to take the pressure off those feeling overwhelmed or isolated or otherwise disenfranchised.
Spending TIME together The quality of the time together is the key for this code. Sometimes the time together is bonding, sometimes it is very intentional and productive time together.
Informal gathering When students gather informally together
Places Where are people gathering/meeting
AASHE
Symposia/colloquium at PC
Restaurant/bar
Living quarters at PC/retreat
Cohort retreat
Residency CLASSTIME In the classes for the cohort fulfilling their residency requirement specifically, year 1.
Regional contact Connections made or facilitated due to regional affiliation
LISTENING listening to one another
Collaborating Students team up to collaborate to stay together and continue to work together, particularly evident in year 2 with shared courses.
Emotional Support
Community BEYOND Prescott Support comes from people outside of Prescott group(s). The person's wider network on facebook, for example.
Acts of LOVE or CARING Especially touching moments of community helping an individual
Network in action This is specifically when students and graduates call upon their colleagues to share their expertise. Its the network that is formed in the program in action outside of the program. This is different from networks of individuals who are not part of the program in some way.
Isolation Examples of how students deal with and overcome or work through feelings of isolation.
Working THROUGH Strategies for working through feelings of isolation.
Contributing FACTORS Factors that contribute to or cause student's feelings of isolation.

Build professional network & relationships This is more about building relationships that are good as part of the professional network. They can be internal to the program or external as in finding mentors and related contacts.

Feedback loop In many instances feedback is required - specific communication - to keep the system working and/or adapting and/or improving. The system can be the student, the institution, the student/mentor relationship, the mentor/institution relationship, the institution/student relationship, etc.
**Reaching out** In some cases individuals need to reach out, to not be afraid to ask for help, academically or personally.

**Imitation** Someone imitates what someone else has done

**Better LEARNING** Instances where learning is identified as happening or as being deeper or better or transforming because of collaboration or community

**Lack of** This is a lack of something that is another code, so for example a lack of advice on finding mentors or a lack of advice on educating mentors. As identified by the participants. Something that didn't happen.

**Wish** opinions or ideas for making the community work better for the students

**SUGGESTION** Suggestions for ways to improve graduate student experience

**Critical correction - family or friends outside of program**

**Bonding** specific times when students bonded with one another
Appendix B
Survey Instrument: Alumni

Note: The survey questions sent to alumni are presented below. These questions were only presented to survey participants who had clicked their agreement to participate on the initial informed consent screen.

Q6 In which country do you reside?
- United States of America
  [Note: A complete list of countries is presented, in alphabetical order, after the United States of America. They are not listed here in order to conserve space.]

Q8 In which state do you currently reside?
- [Note: A complete list of states is presented, in alphabetical order. They are not listed here in order to conserve space.]

Q10 What is your age?
- 25-29
- 30-39
- 40-49
- 50-59
- 60-69

Q12 What is your gender?
- Female
- Male
- Trans
- Other

Q14 What is your household structure?
- Married-couple or life-partners
- Single female householder
- Single male householder
- A group of unrelated subfamilies
- Unrelated individuals
Q16 Do you have dependents that you care for at home?
- Child or children
- Parent or parents
- Dependent spouse/partner
- Other, related dependents
- Other, unrelated dependents
- None

Q18 What are your previous degrees and areas of concentration prior to your PhD in Sustainability Education?
For example: B.S. in Education and M.A. in Performing Arts

Q20 Different types of Master degrees expect different numbers of years to complete. With respect to your most recently completed Master degree, did you:
- Complete the degree in the expected amount of time
- Take one year beyond the expected amount of time
- Take two years beyond the expected amount of time
- Take more that two years beyond the expected amount of time

Q22 What current professional memberships do you hold?
For example: American Educational Research Association, National Science Teachers Association

Q24 How do you define success as a graduate student in sustainability education?

Q26 With respect to your success in the Prescott College Sustainability Education PhD program, what was the most influential bit of advice you received from another student?

Q28 As a result of your participation in the program, did you experience a transformational moment that you are willing to share? If yes, please do so below:

Q30 Can you describe an "identity moment" that you experienced as a sustainability educator, when you felt in a powerful way your knowledge and expertise in the field of sustainability education?

Q32 What is your dream job after having completed your PhD in Sustainability Education? Are you currently in your dream job?

Q34 When you were in the program did you ever have fears or concerns about not being able to complete your PhD?
- Yes
- No

If Yes Is Selected, Then Skip To You indicated that you had fears or c...
Q36 You indicated that you had fears or concerns about completing your degree. Did you worry that any of the following would have interfered with your completing your degree? To what extent?

<table>
<thead>
<tr>
<th></th>
<th>Always worry</th>
<th>Sometimes worry</th>
<th>Rarely worry</th>
<th>Never worry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial burden, loan  debt</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Inability to balance family obligations with school</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Inability to balance work obligations with school</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The fit of the degree to the work that you ultimately want to do</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Q38 Are you a collaborator by nature or do you prefer to work alone?

<table>
<thead>
<tr>
<th></th>
<th>Often</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer to work with one other person</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I prefer to work in a small group</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I prefer to work alone</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Q40 If you submitted work for presentation or publication, did you have members of your cohort or other group of Prescott College students review your materials for you first?

☐ Yes, members of my cohort reviewed my work and provided feedback
☐ Yes, members of other cohorts reviewed my work and provided feedback
☐ Yes, members from my cohort and other cohorts reviewed my work and provided feedback
☐ No other students reviewed my work
Q42 Rank what was most useful in helping you choose and/or refine your dissertation topic, with 1 (the top entry) being the most useful. Note: Drag the lines into rank position.

- First year coursework
- Poster presentation at the Sustainability Symposium
- Presentation at the Sustainability Symposium
- Conversations with members of your cohort
- Conversations with other students outside of your cohort
- Advice and mentoring from your core faculty
- Advice and mentoring from your dissertation committee
- Other

Q44 What were your major reasons for communicating with your peers in the Prescott College PhD program?

- help with assignments
- collaboration on assignments
- help with administrative paperwork
- moral support
- friendship
- consulting their subject expertise
- providing your subject expertise
- networking
- similar research interests
- similar work experiences
- similar family situations
- other ____________________

Q46 Check all methods you used when communicating with individual members of your cohort:

- email
- phone
- text messages
- Moodle
- Skype
- Facebook
- in person
- other ____________________
Q48 Check all methods you used when communicating with individual members of other cohorts:
- email
- phone
- text messages
- Moodle
- Skype
- Facebook
- in person
- other ____________________

Q50 In developing a peer support structure with other Prescott College students, how would you characterize your core group?
- Mostly same gender as mine
- Mostly opposite gender from mine
- Equally mixed

Q52 Check all methods you used when communicating with small groups of Prescott College PhD graduate students:
- email
- phone conference
- text messages
- Skype
- Facebook
- in person
- Moodle
- Elluminate
- Adobe Connect
- other ____________________

Q54 Think of one person in your cohort who excelled at sharing information within your cohort. Describe one or two ways in which they kept your cohort connected through their information sharing activities.

Q56 Think of one person who excelled at sharing information across the entire Prescott College PhD community. Describe one or two ways in which they kept everyone connected through their information sharing activities.
Q58 This research uses a grounded theory methodology, which requires iterative stages of data collection. If you are willing to be contacted again as part of this research study, please indicate Yes below.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am willing to be contacted</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>for future surveys</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I am willing to be contacted</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>for future interviews</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Q60 You have indicated that you are willing to be contacted again as part of this research study. Thank you for your support of this research. You must include your contact information, as it is not saved elsewhere by the survey software.

  - First Name
  - Last Name
  - E-Mail
  - Phone
  - Mailing address
  - City
  - State
  - Country
  - Zip
Appendix C
Survey Instrument: Current Students

Note: The survey questions sent to current students are presented below. These questions were only presented to survey participants who had clicked their agreement to participate on the initial informed consent screen.

Q1 In which PhD Cohort did you begin at Prescott College?
   - Cohort 1
   - Cohort 2
   - Cohort 3
   - Cohort 4
   - Cohort 5
   - Cohort 6
   - Cohort 7
   - Cohort 8

Q2 With which PhD Cohort do you expect to graduate?
   - Cohort 4
   - Cohort 5
   - Cohort 6
   - Cohort 7
   - Cohort 8
   - Don't know

Q3 In which country do you currently reside?
   - United States of America

   [Note: A complete list of countries is presented, in alphabetical order, after the United States of America. They are not listed here in order to conserve space.]

Q4 In which state do you currently reside? (Click Next Question if you reside outside of the U.S.)
   - [Note: A complete list of states is presented, in alphabetical order. They are not listed here in order to conserve space.]

Q5 What is your age?
   - 25-29
   - 30-39
   - 40-49
   - 50-59
   - 60-69
Q6 What is your gender?
○ Female
○ Male
○ Trans
○ Other

Q7 What is your household structure?
○ Married-couple or life-partners
○ Single female householder
○ Single male householder
○ A group of unrelated subfamilies
○ Unrelated individuals

Q8 Do you have dependents that you care for at home?
☐ Child or children
☐ Parent or parents
☐ Dependent spouse/partner
☐ Other, related dependents
☐ Other, unrelated dependents
☐ None

Q9 What are your previous degrees and areas of concentration?
For example: B.S. in Education and M.A. in Performing Arts

Q10 Different types of Master degrees expect different numbers of years to complete. With respect to your most recently completed Master degree, did you:
○ Complete the degree in the expected amount of time
○ Take one year beyond the expected amount of time
○ Take two years beyond the expected amount of time
○ Take more than two years beyond the expected amount of time

Q11 What current professional memberships do you hold?
For example: American Educational Research Association, National Science Teachers Association

Q12 How do you define success as a graduate student in sustainability education?

Q13 With respect to your success in the Prescott College Sustainability Education PhD program, what is the most influential bit of advice you have received from another student?
Q14 As a result of your participation in this program, have you experienced a transformational moment that you are willing to share? If yes, please do so below:

Q15 Can you describe an "identity moment" that you have experienced as a sustainability educator, when you felt in a powerful way your knowledge and expertise in the field of sustainability education?

Q16 What is your dream job after you have completed your PhD in Sustainability Education?

Q17 Do you ever have fears or concerns about not being able to complete your PhD?

☐ Yes
☐ No

If Yes Is Selected, Then Skip To Q18 You indicated that you have fears or...

Q18 You indicated that you have fears or concerns about completing your degree. Do you worry that any of the following will interfere with your completing your degree? To what extent?

<table>
<thead>
<tr>
<th></th>
<th>Always worry</th>
<th>Sometimes worry</th>
<th>Rarely worry</th>
<th>Never worry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial burden, loan debt</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Inability to balance family obligations with school</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Inability to balance work obligations with school</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The fit of the degree to the work that you ultimately want to do</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Other</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Q19 Are you a collaborator by nature or do you prefer to work alone?

<table>
<thead>
<tr>
<th></th>
<th>Often</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer to work with one other person</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>I prefer to work in a small group</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>I prefer to work alone</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>

Q20 If you have submitted work for presentation or publication, did you have members of your cohort or other group of Prescott College students review your materials for you first?

- Yes, members of my cohort reviewed my work and provided feedback
- Yes, members of other cohorts reviewed my work and provided feedback
- Yes, members from my cohort and other cohorts reviewed my work and provided feedback
- No other students reviewed my work

Q21 Rank what has been most useful in helping you choose and/or refine your dissertation topic, with 1 (the top entry) being the most useful.
**Note:** Drag the lines into rank position.

- _____ First year coursework
- _____ Poster presentation at the Sustainability Symposium
- _____ Presentation at the Sustainability Symposium
- _____ Conversations with members of your cohort
- _____ Conversations with other students outside of your cohort
- _____ Advice and mentoring from your core faculty
- _____ Advice and mentoring from your dissertation committee
- _____ Other

Q22 What are your major reasons for communicating with your peers in the Prescott College PhD program?

- help with assignments
- collaboration on assignments
- help with administrative paperwork
- moral support
- friendship
- consulting their subject expertise
- providing your subject expertise
- networking
- similar research interests
- similar work experiences
- similar family situations
- other ____________________
Q23 Check all methods you use when communicating with individual members of your cohort:
- email
- phone
- text messages
- Moodle
- Skype
- Facebook
- in person
- other ____________________

Q24 Check all methods you use when communicating with individual members of other cohorts:
- email
- phone
- text messages
- Moodle
- Skype
- Facebook
- in person
- other ____________________

Q25 In developing a peer support structure with other Prescott College students, how would you characterize your core group?
- Mostly same gender as mine
- Mostly opposite gender from mine
- Equally mixed

Q26 Check all methods you use when communicating with small groups of Prescott College PhD graduate students:
- email
- phone conference
- text messages
- Skype
- Facebook
- in person
- Moodle
- Elluminate
- Adobe Connect
- other ____________________
Q27 Think of one person in your cohort who excels at sharing information within your cohort. Describe one or two ways in which they keep your cohort connected through their information sharing activities.

Q28 Think of one person who excels at sharing information across the entire Prescott College PhD community. Describe one or two ways in which they keep everyone connected through their information sharing activities.

Q29 This research uses a grounded theory methodology, which requires iterative stages of data collection. If you are willing to be contacted again as part of this research study, please indicate Yes below.

<table>
<thead>
<tr>
<th>I am willing to be contacted for future surveys</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am willing to be contacted for future interviews</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

If I am willing to be contacted... Is Selected, Then Skip To Q30 You have indicated that you are willing to be contacted again as part of this research study.

Thank you for your support of this research. You must include your contact information, as it is not saved elsewhere by the survey software.

First Name
Last Name
E-Mail
Phone
Mailing address
City
State
Country
Zip
Appendix D
Anecdote Circle Themes and Prompts

THEMES

• Cultivating effective mentor relationships
• Effects of camaraderie on individual persistence
• Participation in (cohort or overall graduate student) community

PROMPTS

1. (Cultivating effective mentor relationships) Think about your experiences, both positive and negative, as a student being mentored in your courses. Now consider your role as a person others look to for advice or counseling. For example, this could be in your position as a teacher mentoring students, as a group or team leader mentoring members of a team, or as a colleague mentoring another peer here in school or at work. Have you ever found yourself in your role as a mentor behaving in a way that was influenced by one of your own mentors? Can you give an example of when you behaved in a way influenced by your own mentor?

2. (Effects of camaraderie on individual persistence) Graduate work is often described as lonely and isolating, particularly for students in online or low residency programs such as ours. Think about a time when you felt especially isolated and apart from your cohort or the entire Prescott College community. When was that feeling most noticeable and what did you do to overcome that feeling?

3. (Participation in community) Think about times when you have had something to offer the rest of your cohort in support of their learning. For example, you may have shared your expertise or experience in an area of sustainability, your understanding of a topic, or clarification of a concept in the coursework. What is your favorite example of a time when you felt like you were really helping your colleagues academically?

4. (Cultivating effective mentor relationships) Consider any advice you have received from other students about working with mentors for your courses. Now think specifically about advice about establishing an effective working relationship with your mentor. Describe a time when you followed another student’s advice, including the outcome.

5. (Effects of camaraderie on individual persistence) Consider a conversation you have had with another student or group of students about difficulties or frustrations in completing the PhD program. These could be difficulties with coursework or research, with administrative tasks, or in balancing home or work obligations with school. Think about the best advice you have received and followed in order to overcome a difficulty or ease a frustration. What was the advice and when was it most useful?

6. (Participation in community) Think about your interactions with other Prescott College PhD students specifically when you were engaged with your coursework. This could have been online
or in person, as part of your cohort or with an individual student. When was the most effective or memorable learning experience - or “Ah ha!” moment - that took place as a result of your interaction? What was happening at that time?
Appendix E
Interview Instrument

Interview instructions: Supported student success

Interview participants will be selected based on self-selection on completed survey forms or by recommendation from other students. Interview participants will be read and sign an Informed Consent Form prior to the interview. Interviews will be recorded using phone or web technologies. Interviews should take approximately 60 minutes.

Interview questions:

For all questions, the use of specific examples and stories to illustrate the answer will be encouraged.

1. Think about what you say when you introduce yourself to a new person. What are the different ways that you identify who you are? (For example, do you identify as a student, a teacher, a mother, etc.)

2. Describe an “identity moment” that you have experienced as a sustainability educator, when you felt in a powerful way your knowledge and expertise in this area?

3. How do you define “success” as a graduate student?
   a. What is your past experience with “success” academically?
   b. Think back to when you were an undergraduate, when you were a graduate student, when you first became a doctoral student, and now. Has your definition of success changed over time?

4. In what ways are students helping each other within your cohort?
   a. Is it with “developmental” help?
   b. Is the support primarily administrative?
   c. Is it thinking support (e.g., conversations about program goals for individuals)?
   d. Is it advice on how to complete the degree?

5. What stories do students in your cohort retell from students in previous cohort?
   a. Are they primarily stories containing advice on how to manage your courses and research?
   b. Are they about how to choose and manage mentors?
   c. Are they about managing work/school/life conflicts?

6. Can you give an example of an institutional constraint or barrier that peer advice or stories helped you to overcome? How did the advice or story help you, specifically?
7. Can you give an example of a personal constraint or barrier (e.g., family, work/life balance) that peer advice or story has helped you to overcome or manage better?

8. How are you connecting with peers that are researching something completely different?
   a. Are you learning from them (e.g., about the topic)?
   b. Are you helping them learn a topic?
   c. Do people seek you out for your expertise?

9. Who provides “critical correction” for you?
   a. Who do you go to for feedback on your ideas, writing, etc?
   b. Who seeks your advice and how do they go about asking for it?
   c. Peers, family, core faculty, mentors?

10. When did you first realize that you had community or mentoring relationship with other students in the program?
    a. When did it solidify?
    b. When did a mentoring relationship with a faculty solidify?

11. Have you reached a point where you feel you are a knowledge producer rather than a knowledge consumer in Sustainability Education?
    a. If you have, can you describe what that realization felt like?
    b. If you have not, do you have expectations about when you might reach that point given the research and writing involved in graduate work?

12. Can you describe ways in which your cohort has divided itself?
    a. For example, geographically, by topic/discipline, research methodologies, similar life situations?

13. Can you describe ways in which you have bonded with students outside of your cohort?
    a. For example, is it based on topic/discipline, geographic proximity, friends of cohort-mates, shared coursework, etc?
Appendix F
Informed Consent: Survey

Note: Surveys used the Qualtrics Survey software. Each survey began with the informed consent screen. At the end of the screen survey recipients were required to agree to participate before any actual survey questions were presented. Recipients who did not agree to participate were immediately exited from the survey and were presented with the message “We thank you for your time spent taking this survey. Your response has been recorded.” Recipients who agreed to participate were presented with a series of questions.

Informed Consent Form
Prescott College PhD Program
Survey: Supported Student Success Research

Please read this consent form and then click next question at the bottom of the page. You will be asked to agree to participate on the following screen.

Introduction
You are being invited to take part in a research study. The information in this form is provided to help you decide whether or not to take part. Study personnel will be available to answer your questions and provide additional information.

By completing and submitting this online survey you are indicating your consent to take part in this study. Surveys are automatically anonymous unless you indicate your permission to be surveyed and/or interviewed at a later date and provide your contact information on the survey form. If contacted for a follow-up survey or interview you will be provided with an additional Informed Consent form to read and sign at that time.

What is the purpose of this research study?
This research concentrates on stories shared among students in order to support one another in the practice of becoming/being successful sustainability education graduate students.

Communities of Practice in Prescott College’s Sustainability Education PhD program provide the framework within which this research is conducted. The focus on students’ development from novice to experienced graduate student will help deepen the available research in the area of student support and success. The goal is to formulate a theory of supported student success that will inform graduate program development in ways that will help nurture students in their role of becoming/being a successful student.

This research is being completed as part of Aimee deChambeau's PhD coursework in Sustainability Education through Prescott College.

Why are you being asked to participate?
You are being invited to participate because you are currently enrolled in, or recently graduated from, the Prescott College Sustainability Education PhD program.
How many people will be asked to participate in this study?
46 people will be asked to participate in this study.

What will happen during this study?
Although you may choose to remain anonymous, the surveys are constructed in such a way as to only be submitted once per participant. Survey results will be analyzed for common themes and trends. Individuals who provide permission to be contacted and include their contact information on their submitted survey may be interviewed as a follow-up to the survey results. Final research results will be available upon request and as part of the principle investigator’s dissertation, which will be published as Open Access.

How long will I be in this study?
About 20 minutes will be needed to complete the survey, depending on the length of some of your answers. If you agree to be interviewed at a later date that will require approximately one additional hour of your time, at your convenience.

Are there any risks to me?
Responding to these survey questions should carry very little risk to you. Although every attempt has been made to avoid risks, you may feel that some questions are stressful or upsetting. If this occurs you can stop participating immediately by simply closing your web browser.

Are there any benefits to me?
You will not receive any benefit from taking part in this study. Participation in this study, however, may result in improved student support within the college’s graduate programs.

Will there be any costs to me?
Aside from your time, there are no costs to you for taking part in this study.

Will I be paid to participate in the study?
There is no monetary or material compensation to you for your participation in this study.

Will video or audio recordings be made of me during the study?
No recordings are made of your completion of the survey. However, if you are willing to be interviewed as a follow-up to the survey an audio and/or video recording will be made using web technologies. In such cases you will be provided with an additional Informed Consent form to sign before any recording takes place.

Will the information that is obtained from me be kept confidential?
The survey tool links your invitation to a specific instance of the survey so that you can only submit one survey and so that we may send a reminder invitation if necessary. The survey software records survey responses anonymously and no personal information linking you to the research results is saved. Your personal and contact information used to send you the initial survey invitation and any reminder invitations will be confidential. You will not be identified in any reports or publications resulting from the study. Any quotes will be attributed to pseudonyms. Any potentially identifying information revealed in long answers on the survey will be anonymized.
If you choose to be interviewed at a later date the only person who will know that you participated in this study will be the principle investigator, Aimee deChambeau.

It is possible that representatives of the Federal Government or some other group that supports or monitors research studies will want to come to Prescott College to review your information. If that occurs, a copy of the information may be provided to them but your name will be removed before the information is released.

**May I change my mind about participating?**
Your participation in this study is entirely voluntary. You may decide to not respond to the survey or to stop completing the survey at any time and simply not submit it. Your decision not to participate or to discontinue participating will have no effect on any future relationship you may have with the principle investigator or Prescott College.

**Whom can I contact for additional information?**
You can obtain further information about the research or voice concerns or complaints about the research by calling the principal investigator: Aimee deChambeau, MLS, at (330) 972-7488. If you have questions concerning your rights as a research participant, have general questions, concerns or complaints or would like to give input about the research and can’t reach the researcher, or want to talk to someone other than the researcher, you may call the Prescott College Human Subjects Committee Chairperson, Noel Cox Caniglia for this study at (928) 350-3201. If you would like to contact the Human Subjects Committee Chairperson by email, please use the following email address: ncaniglia@prescott.edu

**Participant's Signature**
By choosing YES on the next screen, and by submitting your survey you affirm that you have read the information contained in this form, that the study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You do not give up any of your legal rights by submitting your survey.

**Statement by person obtaining consent**
I certify that I have explained the research study to the person who has agreed to participate, and that he or she has been informed of the purpose, the procedures, the possible risks and potential benefits associated with participation in this study. Any questions raised have been answered to the participant’s satisfaction.

Aimee deChambeau  
Name of study personnel

Study personnel signature:  
Aimee deChambeau  
Signed 24 April 2012

*Please read this consent form and then click next question at the bottom of the page. You will be asked to agree to participate on the following screen.*
Q34 I agree of my own free will to participate in this survey.
   - Yes
   - No

If No Is Selected, Then Skip To End of Survey
Appendix G
Informed Consent: Anecdote Circle

Prescott College Ph.D. Program
Informed Consent
Anecdote Circles: Supported Student Success Research

Introduction
You are being invited to take part in a research study. The information in this form is provided to help you decide whether or not to take part. Study personnel will be available to answer your questions and provide additional information.

You previously responded to a recruitment email indicating your interest in being part of an anecdote circle for the purposes of this study. In this study, anecdote circles allow us to share examples in the form of anecdote about our experiences as Sustainability Education students within the Prescott College PhD program.

What is the purpose of this research study?
This research concentrates on interactions among students in order to support one another in the practice of becoming/being successful sustainability education graduate students. Communities of Practice in Prescott College’s Sustainability Education PhD program provide the framework within which this research is conducted. The focus on students’ development from novice to experienced graduate student will help deepen the available research in the area of student support and success. The goal is to formulate a theory of supported student success that will inform graduate program development in ways that will help nurture students in their role of becoming/being a successful student.

This research is being completed as part of Aimee deChambeau's PhD coursework in Sustainability Education through Prescott College.

Why are you being asked to participate?
You are being invited to participate because you are currently enrolled in, or recently graduated from, the Prescott College Sustainability Education PhD program.

How many people will be asked to participate in this study?
Five to eight people will be asked to participate in each anecdote circle, with the principle investigator as facilitator. Three to five anecdote circles will be conducted.

What will happen during this study?
Anecdote circles are being conducted to collect stories, anecdotes, and narratives from participants that illustrate more fully their experiences in being/becoming successful graduate students. Final research results will be available upon request, and as part of the principle investigator’s dissertation, which will be published as Open Access.

How long will I be in this study?
The anecdote circle will require less than 90 minutes of your time, scheduled at the convenience of the group.

**Are there any risks to me?**
Relating examples of your experiences should carry very little risk to you. Although every effort has been made to avoid risks, you may feel that some stories or prompts for stories are stressful or upsetting. If this occurs you can stop participating immediately.

**Are there any benefits to me?**
You will not receive any benefit from taking part in this study. Participation in this study, however, may result in improved student support within the college’s graduate programs.

**Will there be any costs to me?**
Aside from your time, there are no costs to you for taking part in this study.

**Will I be paid to participate in the study?**
There is no monetary or material compensation to you for your participation in this study.

**Will video or audio recordings be made of me during the study?**
An audio recording of the anecdote circle session will be made. No video recordings will be made.

**Will the information that is obtained from me be kept confidential?**
You will not be asked for any personal or contact information as part of this exercise with the exception of your name and signature on this consent form. You will not be identified in any reports or publications resulting from the study. Any quotes will be attributed to pseudonyms. Any potentially identifying information revealed in anecdotes told during the anecdote circle will be edited to preserve anonymity for the storyteller and any people mentioned within the anecdote.

Since anecdotes are shared with the group during the anecdote circle exercise, it is impossible to guarantee that participants will not repeat what they’ve heard sometime in the future. Because maintaining confidentiality is not entirely under the control of the researcher, you should be as open and honest as possible but remain mindful of the limits on the researcher's ability to protect confidentiality.

Your personal and contact information will be confidential. You will not be identified in any reports or publications resulting from the study. Any quotes will be attributed to pseudonyms. Any potentially identifying information revealed in stories told during the anecdote circle will be edited to preserve anonymity for the participant and any people mentioned within the anecdote.

It is possible that representatives of the Federal Government or some other group that supports or monitors research studies will want to come to Prescott College to review your information. If that occurs, a copy of the information may be provided to them but your name will be removed before the information is released.
May I change my mind about participating?
Your participation in this study is entirely voluntary. You may decide to not respond during the anecdote circle or to stop participating completely at any time. Your decision not to participate or to discontinue participating will have no effect on any future relationship you may have with the principle investigator or Prescott College.

Whom can I contact for additional information?
You can obtain further information about the research or voice concerns or complaints about the research by calling the principal investigators, Aimee deChambeau, MLS, at (330) 972-7488.

If you have questions concerning your rights as a research participant, have general questions, concerns or complaints or would like to give input about the research and can’t reach the researcher, or want to talk to someone other than the researcher, you may call the Prescott College Human Subjects Committee Chairperson, Noel Cox Caniglia for this study at (928) 350-3201. If you would like to contact the Human Subjects Committee Chairperson by email, please use the following email address: ncaniglia@prescott.edu

Your Signature
By signing this form, I affirm that I have read the information contained in the form, that the study has been explained to me, that my questions have been answered and that I agree to take part in this study. I do not give up any of my legal rights by signing this form.

__________________________________
Name (Printed)

__________________________________  ______________
Participant’s Signature  Date signed

Statement by person obtaining consent
I certify that I have explained the research study to the person who has agreed to participate, and that he or she has been informed of the purpose, the procedures, the possible risks and potential benefits associated with participation in this study. Any questions raised have been answered to the participant’s satisfaction.

Aimee deChambeau
Name of study personnel

Aimee deChambeau  26 April, 2012
Study personnel signature  Date signed
Appendix H
Informed Consent: Interview

Prescott College Ph.D. Program
Informed Consent
Interviews: Supported Student Success Research

Introduction
You are being invited to take part in a research study. The information in this form is provided to help you decide whether or not to take part. Study personnel will be available to answer your questions and provide additional information.

You previously completed and submitted a survey on which you indicated your consent to be contacted and interviewed as a follow-up to that survey OR your peers have identified you as a key communicator within and across the Prescott College PhD cohorts.

What is the purpose of this research study?
This research concentrates on stories shared among students in order to support one another in the practice of becoming/being successful sustainability education graduate students. Communities of Practice in Prescott College’s Sustainability Education PhD program provide the framework within which this research is conducted. The focus on students’ development from novice to experienced graduate student will help deepen the available research in the area of student support and success. The goal is to formulate a theory of supported student success that will inform graduate program development in ways that will help nurture students in their role of becoming/being a successful student.

This research is being completed as part of Aimée deChambeau's PhD coursework in Sustainability Education through Prescott College.

Why are you being asked to participate?
You are being invited to participate because you are currently enrolled in, or recently graduated from, the Prescott College Sustainability Education PhD program.

How many people will be asked to participate in this study?
5 to 10 people will be asked to participate in this interview portion of the study.

What will happen during this study?
Interviews are being conducted to help answer questions provoked by previously submitted survey responses and to collect stories, anecdotes, and narratives from participants that illustrate more fully their experiences in being/becoming successful graduate students. Final research results will be available upon request, and as part of the principle investigator’s dissertation, which will be published as Open Access.

How long will I be in this study?
The interview will require approximately one hour of your time, at your convenience.

Are there any risks to me?
Responding to interview questions and relating stories of your experiences should carry very little risk to you. Although every effort has been made to avoid risks, you may feel that some questions are stressful or upsetting. If this occurs you can stop participating immediately.

**Are there any benefits to me?**
You will not receive any benefit from taking part in this study. Participation in this study, however, may result in improved student support within the college’s graduate programs.

**Will there be any costs to me?**
Aside from your time, there are no costs to you for taking part in this study.

**Will I be paid to participate in the study?**
There is no monetary or material compensation to you for your participation in this study.

**Will video or audio recordings be made of me during the study?**
An audio recording of your interviews will be made using web, phone conferencing, or digital recorder technologies *only if you check the box below:*

☐ **I give my permission for an audio recording to be made of me during my participation in this research study.**

**Will the information that is obtained from me be kept confidential?**
The only person who will know that you participated in this study will be the principle investigator, Aimée deChambeau.

Your personal and contact information will be confidential. You will not be identified in any reports or publications resulting from the study. Any quotes will be attributed to pseudonyms. Any potentially identifying information revealed in stories told or long answers to interview questions will be anonymized.

It is possible that representatives of the Federal Government or some other group that supports or monitors research studies will want to come to Prescott College to review your information. If that occurs, a copy of the information may be provided to them but your name will be removed before the information is released.

**May I change my mind about participating?**
Your participation in this study is entirely voluntary. You may decide to not respond to interview questions or to stop the interview completely at any time. Your decision not to participate or to discontinue participating will have no effect on any future relationship you may have with the principle investigator or Prescott College.

**Whom can I contact for additional information?**
You can obtain further information about the research or voice concerns or complaints about the research by calling the principal investigators, Aimée deChambeau, MLS, at (330) 972-7488. If you have questions concerning your rights as a research participant, have general questions, concerns or complaints or would like to give input about the research and can’t reach the
researcher, or want to talk to someone other than the researcher, you may call the Prescott College Human Subjects Committee Chairperson, Noël Cox Caniglia for this study at (928) 350-3201. If you would like to contact the Human Subjects Committee Chairperson by email, please use the following email address: ncaniglia@prescott.edu

**Your Signature**
By signing this form, I affirm that I have read the information contained in the form, that the study has been explained to me, that my questions have been answered and that I agree to take part in this study. I do not give up any of my legal rights by signing this form.

__________________________________
Name (Printed)

__________________________________   ______________________
Participant’s Signature   Date signed

**Statement by person obtaining consent**
I certify that I have explained the research study to the person who has agreed to participate, and that he or she has been informed of the purpose, the procedures, the possible risks and potential benefits associated with participation in this study. Any questions raised have been answered to the participant’s satisfaction.

Aimée deChambeau

Name of study personnel

*Aimée deChambeau*   6 September 2013
Study personnel signature   Date signed