

GOAL INTRODUCTION IN ONLINE DISCUSSION FORUMS:  
AN ACTIVITY SYSTEMS ANALYSIS

by

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## ABSTRACT

### GOAL INTRODUCTION IN ONLINE DISCUSSION FORUMS: AN ACTIVITY SYSTEMS ANALYSIS

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Self-direction is the process by which individuals collaborate in the construction of meaningful learning objectives and use internal and external controls to meet those objectives. In professional contexts, self-direction is seen as an increasingly important skill for engagement in complex organizations and industries. Modern innovations in program development for adult learners, therefore, should address learners' needs for self-motivation, self-monitoring, and self-management. Social learning contexts—such as online class discussion forums—have emerged as potentially democratic spaces in online learning. Yet evaluation methods for assessing online discussion have not considered the ways in which student-introduced goals influence how quality is operationalized and studied.

This research attempted to understand if, when, and how adult learners leverage online course discussions as a space to introduce and moderate their own learning and professional goals. The study used activity systems analysis as a framework for assessing self-direction within a complex social learning environment. A sample drawn from three

sections of an online Research Design course was observed, surveyed, and interviewed to develop a visual map and narrative description of their perceptions of a discussion activity system.

A cross-case analysis of these maps was used to define five systemic tensions that prevented students from aligning their goals with the instructor-designed activities. When faced with these tensions, students either subjugated their own goals to an instructor's explicit goals, or else introduced one of eight mediating behaviors associated with self-directed learning. The study yielded five emergent hypotheses that require further investigation: (1) that self-directed learning is not inherent, even among Millennial learners, (2) that self-directed learning is collaborative, (3) that goals for interaction in social learning environments are not universal, (4) that goals must be negotiated, explicit, and activity bound, and (5) that self-directed learning may be not be an observable phenomenon.

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## DEDICATION

This dissertation is dedicated in loving memory to my grandmother, Mildred Dashew (1915-2017).

## ACKNOWLEDGEMENTS

I am grateful that this acknowledgement comes at the beginning of the dissertation. I very humbly admit that each page that follows would be blank if it were not for all of the people who are thanked below.

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B.L.D.

## TABLE OF CONTENTS

	Page
Chapter I - PROBLEM AND PURPOSE OF THE STUDY .....	1
Introduction.....	1
Research Problem .....	4
Research Perspectives.....	9
Research Purpose and Questions .....	13
Research Design Overview.....	15
Assumptions of the Study .....	17
Rationale and Significance .....	18
Chapter II - LITERATURE REVIEW .....	20
Introduction.....	20
A Theoretical Framework for Analyzing Discussion .....	21
Communities of Inquiry .....	21
Leveraging the Community of Inquiry Model in Research .....	23
Self-Direction and Self-Regulation.....	26
Self-Direction and Research on Discussions .....	29
The Self and the Community of Inquiry .....	31
Activity Systems Research .....	33
Conducting Activity System Research .....	36
Conclusions.....	39
Chapter III - METHODOLOGY .....	41
Introduction.....	41
Study Design.....	42
Discussion of the Setting .....	45
Discussion of Sample.....	47
Methods for Assuring Protection of Human Subjects .....	51
Areas of Information Needed.....	53
Methods for Data Collection.....	54
Methods for Data Analysis and Synthesis .....	58
First Cycle Coding .....	59
Second Cycle Coding.....	62
Narrative Development.....	62
Methods for Assuring Validity and Reliability.....	64
Limitations .....	66
Timeline .....	68
Chapter IV - CONTEXT.....	69
Introduction.....	69
About the School.....	69
Online Learning at the University.....	70
Online Learning at the School .....	70



The design process .....	71
Online courses .....	72
Degree Program .....	74
Course .....	75
Discussion Activities .....	77
Activity Design .....	78
Weekly Discussion Prompts .....	84
Week 3 discussion prompt .....	85
Week 8 discussion prompt .....	86
Week 11 discussion prompt .....	88
Conclusions .....	90
Chapter V - RESULTS .....	92
Introduction .....	92
Activity Systems Maps .....	93
Case 1: Wendell .....	95
Case 2: Starla .....	99
Case 3: Merrill .....	105
Case 4: Howard .....	110
Case 5: Rosemary .....	117
Case 6: Peyton .....	123
Case 7: Grover .....	127
Case 8: Jaylee .....	132
Case 9: Amberly .....	136
Student Outcomes Across Activity Systems .....	141
Reviewing the Activity Systems Themes and Tensions .....	144
Tension 1: Goal Confusion .....	147
Inability to describe outcomes .....	148
Missed goal achievement .....	150
Tension 2: Tool promotion of artificial discourse .....	151
Immediacy of reply .....	154
Threading .....	154
Seeing the posts of other students .....	155
Tension 3: Role definition by comfort .....	156
Roles attributed to others .....	157
Roles adopted by students .....	158
Tension 4: Learning from versus learning with .....	159
Tension 5: Structural and temporal disjuncture .....	162
Time and availability .....	163
Structure of the course .....	164
Summary .....	165
Mediation Behaviors .....	166
Mediation 1: Motivation – connecting across levels .....	169
Mediation 2: Monitoring – locating themselves .....	171
Mediation 3: Monitoring – recognizing value .....	172
Mediation 4: Implementation and planning – appreciating time .....	173

Mediation 5: Implementation and planning – identifying boundary permeability .....	174
Mediation 6: Implementation and planning – leveraging difference.....	175
Mediation 7: Communication – recognizing the value of disagreement	176
Mediation 8: Communication – (not) talking about communication.....	177
Summary .....	178
Chapter VI - SYNTHESIS, INTERPRETATION, AND CONCLUSIONS .....	180
Introduction.....	180
Synthesis .....	183
Proposition 1 .....	184
Proposition 2 .....	186
Proposition 3 .....	187
Proposition 4 .....	188
Summary of Propositions.....	188
Implications and Hypotheses .....	189
Hypothesis 1: Self-directed learning is not inherent .....	190
Hypothesis 2: Self-directed learning is collaborative .....	192
Hypothesis 3: Goals for interaction in a social learning environment are not universal.....	194
Hypothesis 4: Goals must be negotiated, explicit, and activity bound. ..	197
Hypothesis 5: Self-directed learning behaviors may not be observable.	200
Conclusions: Towards Conditions Needed for SDL.....	201
Recommendations: Improving the Research Design Course.....	202
Redesigning Learning Activities.....	202
Encouraging reflection.....	203
Attending to whole-course design .....	204
Attending to ‘seat hours’ .....	205
Role definition .....	205
Clarifying the object .....	206
Assigning roles.....	208
Redesigning discussion tools .....	209
Summary .....	211
Discussion.....	211
Self-Directed Learning.....	213
Productive Discussion.....	215
Self-Directed Learning in Productive Discussion.....	216
Implications for Future Research.....	217
Multiple Learning Environments.....	218
Validating the findings.....	218
Validating tensions.....	219
Relationships to Learner Behaviors .....	219
Additional qualitative studies .....	220
Enabling quantitative observation.....	221
Studies of causality .....	222
Impact studies .....	223
Conclusion .....	224

REFERENCES .....	226
Appendix A - Informed Consent Protocols .....	234
Appendix B - Survey .....	242
Appendix C - Interview Schedule.....	245
Appendix D - Mapping Research Protocol to Research Questions .....	249
Appendix E - Codes and Definitions .....	252
Appendix F - Full Design Suggestions for Research Design .....	257

## LIST OF TABLES

Table 1.1: Word Count in Module 3 Discussion, Unique to Section S01, Group 1 .....	12
Table 2.1: Collection Points for Constructing an Activity Systems Analysis .....	38
Table 3.1: Enrollment by Section and Instructor (Using Pseudonyms).....	46
Table 3.2: SDLI Score Distribution of Student Responses (n = 22).....	49
Table 3.3: Participant SDLI Scores (Using Pseudonym).....	50
Table 3.4: Demographic Distribution of Sample and General Program Population .....	51
Table 3.5: Propositions and Evidence Collected .....	54
Table 3.6: Summary of Data Collection Methods .....	57
Table 3.7: Initial Structural Codes .....	62
Table 4.1: Program Curriculum (Fall 2017; Some Course Names Changed) .....	75
Table 4.2: Topics in Research Design .....	76
Table 4.3: Objectives by Instructor.....	78
Table 4.4: Thematic Elements Referenced by Instructor.....	84
Table 4.5: Objectives by Instructor (Week 3).....	86
Table 4.6: Objectives by Instructor (Week 8).....	87
Table 4.7: Objectives by Instructor (Week 11).....	89
Table 5.1: Student-Defined Goals and SDLI Scores .....	143
Table 5.2: Students Below Instructor Average by Assignment.....	144

Table 5.3: Events Requiring Context from Another Case .....	146
Table 5.4: Examples of Goal Versus Takeaway .....	149
Table 5.5: Description of Goals for Week 11 .....	150
Table 5.6: Violations of Conversational Maxims (Grice, 1975) .....	152
Table 5.7: Learning from Versus Learning With.....	160
Table 5.8: Summary of Tensions .....	165
Table 5.9: Code Categorization by SDLI .....	167
Table 5.10: Sample Descriptive Charts for Factor 3: Implementation and Planning .....	169
Table 5.11: Mediating Behavior by SDLI Factor .....	170
Table 5.12: Discussing Value .....	172
Table 5.13: Summary of Tension and Related Mediating Behaviors .....	179
Table 6.1: Summary of Implications and Hypotheses .....	201
Table AD1: Mapping Survey Questions to Research Questions .....	249
Table AD2: Mapping Interview Questions to Research Questions .....	250
Table AE1: Codes and Definitions .....	252
Table AF1: Summary of Recommendations for Design.....	275

## LIST OF FIGURES

<i>Figure 1.1: Activity system map</i> .....	3
<i>Figure 1.2: Visualization of discussion concepts (Baker Stein et al., 2014, p. 102)</i> .....	11
<i>Figure 2.1: Goal setting as an embedded activity</i> .....	35
<i>Figure 2.2: Conceptual model</i> .....	39
<i>Figure 3.1: Activity system defined for Starla</i> .....	63
<i>Figure 4.1: Generic instructor-defined activity system map for discussion</i> .....	83
<i>Figure 5.1: Comprehensive activity system map</i> .....	94
<i>Figure 5.2: Activity system map for Wendell</i> .....	99
<i>Figure 5.3: Activity system map for Starla</i> .....	104
<i>Figure 5.4: Activity system map for Merrill</i> .....	110
<i>Figure 5.5: Activity system map for Howard</i> .....	116
<i>Figure 5.6: Activity system map for Rosemary</i> .....	122
<i>Figure 5.7: Activity system map for Peyton</i> .....	126
<i>Figure 5.8: Activity system map for Grover</i> .....	131
<i>Figure 5.9: Activity system map for Jaylee</i> .....	136
<i>Figure 5.10: Activity system map for Amberly</i> .....	141
<i>Figure 5.11: Goal confusion in the activity system</i> .....	148
<i>Figure 5.12: Impact of tool and rule on community and outcome</i> .....	153

<i>Figure 5.13: Illustration of threading</i> .....	155
<i>Figure 5.14: Inset of student difference in activity systems map</i> .....	157
<i>Figure 5.15: Structural and temporal disjuncture mapped in an activity system</i> .....	162
<i>Figure 6.1: Visibility of discussion rubric</i> .....	207
<i>Figure 6.2: Sample visualized discussion (Baker Stein et al., 2014, p. 96)</i> .....	210
<i>Figure AF.1: Visibility of discussion rubric</i> .....	264
<i>Figure AF.2: Canvas notification preference window</i> .....	267
<i>Figure AF.3: Single branch highlighted in orange</i> .....	268
<i>Figure AF.4: Sample visualized discussion (Baker Stein et al., 2014, p 96)</i> .....	273
<i>Figure AF.5: Merging discussions (highlighted in orange)</i> .....	273

## Chapter I

### PROBLEM AND PURPOSE OF THE STUDY

#### **Introduction**

Learner self-direction is the process by which learners collaborate in constructing meaningful learning objectives and use internal and external controls to meet those objectives. This study leverages a definition and model proposed by Garrison (1997) that views self-directed learning (SDL) as a learning process consisting of self-motivation, self-monitoring, and self-management. SDL is therefore unique from but complementary to self-regulated learning (SRL), which is a capacity for individual self-efficacy within a defined learning environment (Pilling-Cormick & Garrison, 2007). Given the close association of these two frameworks, definitions for SDL have emerged that use the terms interchangeably. Studies that use these definitions explore the ways in which students demonstrate self-efficacy in the pursuit of instructor defined goals (Kim, 2015; Horsely, O'Neill, & Campbell, 2009; Slavit & McDuffie, 2013). While the conflation of these two terms is not problematic when researchers use a definition of SDL that is aligned with their methodology and findings, it does point to an important gap in the present research: rather than focus on the learners' use of self-regulatory behaviors to manage instructor goals, what are the ways that learners use self-directive behaviors to manage learning toward their own?

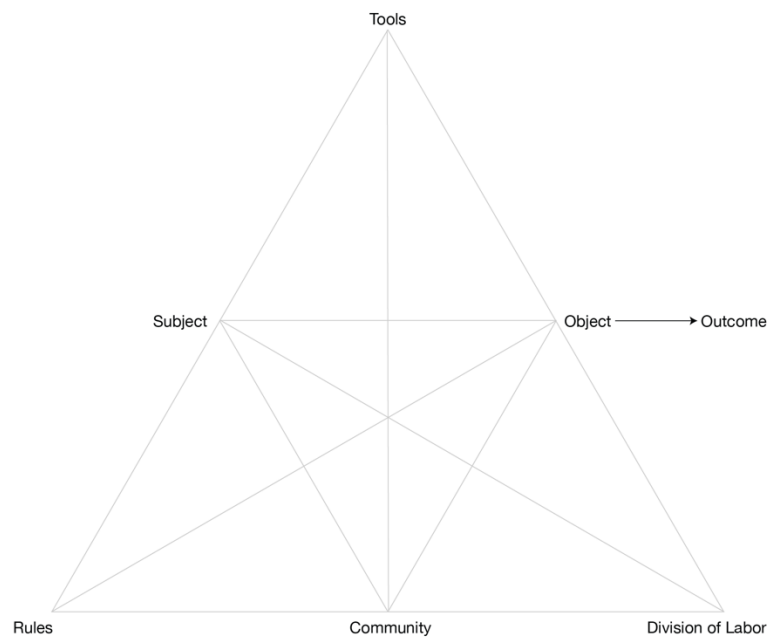


This question is increasingly important in the context of current program development efforts for adult learners and continuing education. Modern innovations in program development—such as competency-based learning platforms or massive open online courseware (MOOCs)—have stressed the importance of individual pathways and the underlying assumption of self-directedness among adult learners (Altahawi, Sisk, Poleskey, Hicks, & Dannefer, 2012).

The gap has further been exposed in research on the social learning context. Prior research by this author was aimed at exploring the ability of data visualization tools for understanding student and instructor behavior in online discussion (Baker Stein, York, & Dashew, 2014). Yet while the research yielded insights about engagement behaviors, it did not address questions of the impact of these behaviors on student learning. The authors noted that unique discussion prompts would carry different “anticipated data fingerprints” (2014, p. 34). From the perspective of self-directed learning, each individual’s goals might further shape the fingerprint, making the assessment of success within social learning environments nearly impossible using standardized measures. Within the formalized learning context, online learning has emerged as a popular venue for the realization of self-directed learning (Song & Hill, 2007) and online class discussions forums as an arena for social meaning making. Yet while there is a proliferation of research based in online discussion, it has traditionally treated the relationship between learner and environment as static, rather than as an evolving and reciprocal context.

Activity systems analysis can be a powerful tool for addressing the difficulty of assessing self-direction within a complex social learning environment. Activity systems

analysis is the mechanism drawn from Engeström’s Cultural Historical Activity Theory (CHAT). CHAT builds on Vygotsky’s model of mediated action (Yamagata-Lynch, 2010). In this model, Vygotsky suggested that an individual’s (subject’s) pursuit of a given goal (object) is mediated by specific tools and artifacts that assist the subject in crafting meaning and achieving the goal. Engeström’s model built on this basic mediated action to develop a mechanism for deeper assessment of the activity system. The central model in activity systems analysis—the activity system map—is illustrated in Figure 1.1 below. In using activity systems analysis, understanding subject, object, mediating factors, and tensions among these elements is important for understanding why the outcome came to pass. In other words, it is a framework that can help researchers understand learners and learner goals, the social learning context in which the goals are introduced and explored, and the learning outcomes represented by the interaction of these domains.



*Figure 1.1: Activity system map*

The remainder of this chapter is dedicated to an exploration of practice- and research-oriented problems present in the context of online class discussions. It also provides more detail about specific research questions emanating from these problems and context. Specific attention is given to how answering such questions may assist in addressing the problems and improving professional practice in the area of online course and program development.

Following this, there is a brief overview of the prior research by this author described in the introduction above. There is then a description of research purpose and design. More specific information about the research framework is found in Chapter II, and more information about the study is found in Chapter III. Assumptions about the sample and research environment are defined. Finally, the chapter concludes with a reiteration of the rationale and significance for completing this research study.

### **Research Problem**

Though correspondence classes have been a part of the United States educational system since the 1700s (Kentnor, 2015), the emergence of programmed distance learning in the late 1970s to early 1980s coincided with the successful commercialization of VCR technology. As more and more people began having access to VCR technologies in their home, the possibility of presenting recordings of expert faculty in distance classes became a reality (Reisslein, Seeling, & Reisslein, 2005). Yet while the work of Malcolm Knowles (1970) on a self-directed, cognitive, and andragogical model of adult learning was beginning to gain prominence at this time, the prevailing program development models before the beginning of the decade were more closely aligned to the behaviorist

model (Merriam, Caffarella, & Baumgartner, 2007). These models treated behavior as a series of stimulus-response (S-R) chains, and framed the goal of instruction as an intention to alter the response to a given stimulus through operant conditioning. Therefore, the goal of program development within organizations was to imbue in individuals the skills needed to meet specific business aims. The model was intended for instrumental learning, but neglected the student experience as a core value component of the teaching and learning process.

Technological capabilities continued to expand, and the first fully online courses at the college level were offered in the early 1980s. Like their predecessors, these online courses were designed to replicate the traditional academic setting: faculty provided lecture material and students were quizzed to assess learning—programmed instruction intended to address specific organizational and vocational needs. But unlike VCR technology, the emerging digital capability afforded untapped potential for collaboration, and faculty and students alike quickly began responding negatively to the new modality (Kentnor, 2015). Compounding the complaints about the model was a developing understanding of adult learning and the role that individual motivation played within the learning process. Knowles' andragogy (1970) identified assumptions about the inherent self-direction of adult learners and defined a linear model for diagnosing motivation and need and building programs to address those needs.

Still, traditional higher education has struggled to simultaneously address the individual needs of adult learners while meeting the regulatory needs imposed by government and educational accrediting agencies. Agencies require, for example, defined learning objectives, assessment plans, and detailed syllabi in order to approve new

programs. This system is designed to promote consistency across courses and offerings, but has the unintended consequence of promoting an uncritical examination of content and objectives as defined by an institutional authority, rather than by the learners themselves. As described by Aronowitz, the goal of higher learning has become “to help the student adapt to the prevailing order, not assimilate its values in terms of her own priorities and interests” (Aronowitz, 2000, p. 1). In other words, traditional educational programming for adults can fail to address the individual needs of learners.

The last half decade has seen the emergence of a new model for program development and delivery. Competency-based educational models were pioneered at for-profit institutions—such as Capella University—before finding its way into schools that uniquely served adult and returning student populations—such as Western Governors University and Southern New Hampshire University—and more traditional institutions such as University of Wisconsin and Arizona State University (Ordonez, 2014). Competency-based programming follows a model of personalized adaptive learning in which students move through the course content at their own pace. As in the more traditional model, students must demonstrate proficiency of all defined performance objectives. Unlike, the more traditional models, however, learner motivation is considered, even if for more logistical purposes, in that students can complete a degree in as little time as they are able to meet the objectives. Still, while these emergent models represent the state of the art in program delivery for educational institutions, they are designed to emphasize the development of individual pathways while deemphasizing social learning contexts (Altahawi et al., 2012). They also assume that that these pathways are based on a defined set of skills and behaviors and learning is best defined as

a proficient display of a stated behavior (Norman, Norcini, & Bordage, 2014). This state of the art in distance education, therefore, relies heavily on dated program development models.

At the same time, online learning—with its ability to capture data from asynchronous discussion activities—has become a popular space for research on learning. In the past decade, asynchronous discussion forums (Gilbert & Dabbagh, 2005; Saade & Huang, 2009), synchronous chats (Park, 2015), and live interactive web conferencing (Leiss, 2010) have all been the subject of significant studies as the locus of social learning within models that have increasingly de-emphasized the social learning experience in favor of individual pathways. The above cited studies have addressed such topics as the critical success factors, the impact on student learning as expressed by performance against instructor-identified learning objectives, and the levels of engagement and participation within specific tools and populations. Measures to evaluate the quality of collaboration in online learning include counting interactions or else looking at the use of concepts identified as core by instructors and researchers. Lu, Chiu, and Law (2011) for example, perform a statistical analysis of the collocation of argumentation and justifications, but their study was not undertaken to address the impact of argumentation tactics within student learning. Others suggested quantitative measures for assessing the number and frequency of participation, but, again, were not attempting to identify how the specific construction of posts and threads might impact learning where an individual's goals are considered (Szabo, 2015; Saade & Huang, 2009).

To address this gap, theoretical constructs of self-direction (how students plan their personal learning environment) and self-regulation (how they moderate the designed

learning environment) must be combined and placed within the context of discussion. One model that has attempted to integrate traditional self-directed learning (SDL) and self-regulated learning (SRL) is Garrison's model for self-directed learning. Garrison's approach is unique in that it is primarily concerned with SDL as a learning process, as opposed to an instructional process or a series of learner attributes. The model—which has subsequently been validated (Abd-El-Fattah, 2010)—describes three psychological constructs that can serve as predictors of academic achievement: management, motivation, and monitoring (Garrison, 1997). Garrison described a model for self-direction that was more than simply task control; SDL is a cognitive task that embodies both self-reflection and self-regulation as learners develop metacognitive awareness and control of the learning process. Self-motivation is a critical component of the model, and “is essential for precipitating interest and maintaining focus” (Pilling-Cormick & Garrison, 2007, p. 17). The “meta-motivational” (2007, p. 17) nature of the model means that self-directed learning involves an awareness of and attention to the specific goals that inform a learner's educational pursuits.

Yet despite the attempt to create an integrative framework for SDL that incorporates elements of both SDL and SRL, Garrison's own attempt to place his SDL model within the context of his own framework for social learning (the Community of Inquiry Framework), the concept of motivation was conspicuously absent when he wrote “the key dimensions [of his SDL model (1997)] are monitoring (reflection) and managing (action) the learning process” (2003, p. 5). The absence of motivation is critical because motivation—a learner's ability to define her own goals—is a key point of differentiation between SDL and SRL. It is another indication of the lack of a coherent model for

understanding how each individual's personal learning goals influence and are influenced by the social learning environment.

New models that account for both the individual and social learning needs of adults are therefore necessary to improve next-generation teaching practice. In part, the current gap may exist because little is understood about whether and how individuals introduce their own learning goals into the educational environment. In online education, discussion provides an opportunity for exploring these goal setting behaviors and placing them in the context of the social learning experience. But research on discussion in the era of competency-based education has tended to rely on the same assumptions about teaching and learning that drive program development efforts. The next generation of research and activity design should therefore consider the processes of self-direction within the context of a social learning environment.

### **Research Perspectives**

In 2014, this author was part of a research team undertaking an investigation of student behaviors in online asynchronous discussion forums (Baker Stein et al., 2014). The research provided a detailed exploration of a single thread of a discussion. Rich visualizations of student questioning behaviors, storytelling behaviors, instructor prodding, and other cues were developed and presented to explain how students maneuvered through the discussion activity. The research served as an important proof-of-concept, demonstrating the possibility of training artificial intelligence (AI) tools to create reference maps of an online discussion.



The implications of the research and practice gap identified above were echoed in the work produced from the partnership. A recurring struggle the authors faced in writing the 2014 research was a realization that even though there was a great deal to be said about what occurred in the discussions, there was little to be offered about why individuals behaved in the way they behaved or—more critical from the program development perspective—whether those behaviors were beneficial to student learning. When a student deviated from the instructor’s question to raise issues related to her own work environment, how was such an act to be interpreted? Was it self-direction or defiance? Was it a positive learning experience if the student was able to reinterpret her own experience or a negative learning experience because she failed to address the question as it was initially posed? In the absence of a framework for understanding how student behavior in social learning environments was related to their own goals for participation and learning, it was difficult to draw conclusions from the research.

These questions framed the initial design of this research study. Coming in with an assumed understanding of how students would behave, the initial research questions proposed to define how students introduced new, personal learning goals into a discussion context. This, of course, presupposes that students do indeed introduce their own goals. The methodology that was defined for identifying goal introduction was based in part on the 2014 research. From within the learning management system, the content of student discussion posts was captured and download as a .CSV file. A qualitative analysis tool—in this case, NVIVO—was used to define a set of common language used across sections of the course and then to define which concepts fell outside of this set. As

in the earlier research, this list of concepts could be visualized to illustrate how individual contributions impact the concept topography of the discussion.

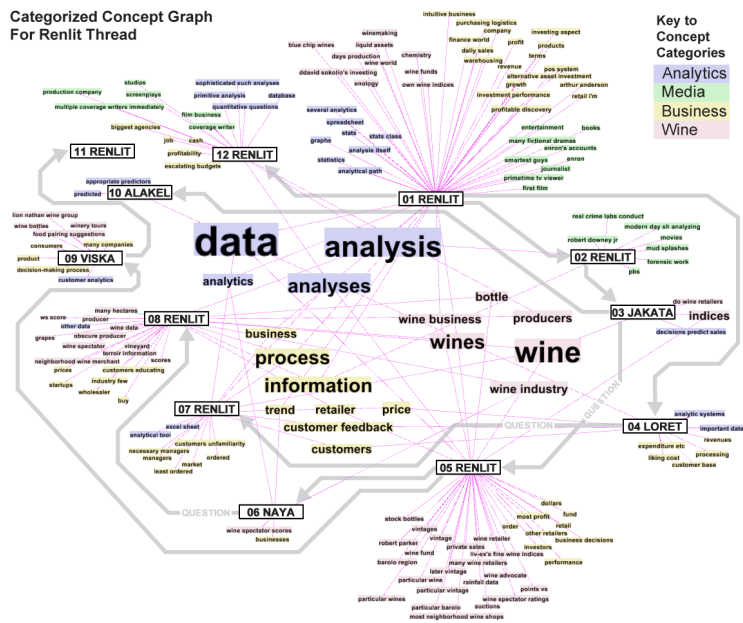


Figure 1.2: Visualization of discussion concepts (Baker Stein et al., 2014, p. 102)

Figure 1.2—taken from the 2004 Social Knowledge Networking research (Baker Stein et al.)—illustrates the utility of these maps for this type of research. The image shows each of the posts from a discussion about media representations of data and analytics. While many groups engaged in the discussion focused on contemporary films such as *Moneyball* and *Sherlock Holmes*, one student from this group (given the pseudonym Renlit in the study) discussed her professional experience using analytics in the wine industry. The topic of wine permeated the discussion. Comparing this map to one from another group would yield the identification of wine and the wine industry as topics that were likely introduced by an individual, rather than as a product of the

instruction or instructional material. Subsequently, Renlit would be identified as an individual who introduced her own concepts into the discussion.

Yet when the first data collection period came, the results for the sample selected for this study were very different. Word count queries from the third week of a Research Design course selected as the site for this study were taken from the discussion files uploaded into NVIVO. These word counts were then combined into a single Excel file that included each word, the total word count within each section, similar words used, and the group number in which the discussion appeared. A pivot table was then used to isolate terms that were unique to each group. Though there had been a prior assumption that the lists would reveal unique concepts related to personal context or goal, they were instead generic—words that appeared in the similar word lists of other sections or else misspellings of common words. A sample of words identified from one group of advanced students is included for illustrative purposes below.

Table 1.1

*Word Count in Module 3 Discussion, Unique to Section S01, Group 1*

2reviewed	Committee	Impressive	Option	Selections
3compared	Conducting	Insights	Pertains	Thank
Answer	Creating	Living	Products	Worked
Asked	Financially			

This result was surprising, and it fundamentally changed the course of this study. The questions shifted from how students engaged in a particular behavior to how they understood the activity and the activity system more broadly. Defining a framework for

understanding how students perceived their own personal goals within a social learning context was a critical antecedent to any research program studying self-direction and discussion. Finding students who engaged in goal introduction—however that was operationalized—became less important as the focus of the study shifted.

In addition to participation within this research context, the author's experience as an instructional designer working with adult learners is also relevant to the study. The design perspective of the curriculum development team that supported faculty in building the online courses that serve as the context for this research is one that has emphasized social networking and engagement as critical to the learning process. This perspective is based partially on anecdotal evidence from instructors and students, but is also based on data from students suggesting that professional network development is a primary driver for enrollment in master's degree programs at the school of professional studies where this course was taught. These design perspectives not only reinforce the rationale for conducting this study, they also inform assumptions about the inherent value of participating in discussion activities and the value of online collaboration as both a space for reinforcement and practice of instructor-defined goals and a democratic space in which students can introduce their own goals for learning.

### **Research Purpose and Questions**

A conclusion of the Baker Stein et al. study on discussion forums described above was that understanding the motivation and participation patterns of students required first a deep understanding of the context in which the discussion occurred. The study showed, for example, that such factors as the time and pace of instructor interaction, the structure

of the initial discussion prompt, and the speech acts being deployed by other participants had an impact on the flow of discussion (2014). What was lacking was a mechanism for understanding the role of individuals within that social learning context. Therefore, the purpose of this research is to explore a discussion context in order to more effectively discern connections between learner self-direction and participation in the broader activity system.

It would be valuable for future research to have a generalizable framework for understanding the connection between individuals and the discussion environment. However, this research is exploratory in nature and asks particularizing questions about the individuals being studied. There are two reasons for this. First, contexts for discussions can vary widely. In order to gain accurate insights into student behavior, the context itself must be explored in depth. Understanding the elements of the activity system and their associated tensions can help to define what elements of student behavior are driven by intrinsic motivation and which are derived from external factors (e.g. technology restrictions, assignment instructions, or implicit rules of social engagement). In addition, this phenomenon represents a significant gap in research (see Chapter II). There is still relatively little understood about how the student behaviors might be different across activity systems and student populations. Therefore, the boundaries of this study were to define a set of hypotheses about these interactions that could be subsequently tested in other environments. Such efforts to predict future behaviors were not, however, a part of this exploratory study. The goal of the study was to develop a cursory understanding of whether and how adult learners (1) introduce, (2) make sense of

and (3) moderate their own learning and professional goals within a social learning context. This study was undertaken to address the following questions:

1. How do individuals introduce and make sense of their own goals for learning in the context of a formal, social learning environment?
2. How do motivation, monitoring, and management mediate the relationship between the instructor-designed and self-constructed activity systems?

### **Research Design Overview**

To address the complexity of a given activity system and the multiplicity of potential student profiles within a given environment, this study took the form of an exploratory multi-case study. Creswell suggested cases are ideal in settings where a researcher wants to explore “a real-life contemporary bounded system (a case)...over time, through detailed, in-depth collection involving multiple sources of information” (2013, p. 97).

This study investigated three sections of a course called *Research Design*, a required course offered in the first semester of a master’s degree program at a school of professional studies in an elite university. Total enrollment across the three sections was 102 students. The sections of this course were designed by a single faculty member to be identical in format and delivery; all readings, lecture materials, teaching notes, activities, rubrics, and facilitation guides were consistent across all sections of the course. All sections of the course were offered online and include both synchronous and asynchronous activities. The synchronous activities were facilitated in a web conferencing system (Adobe Connect), while all asynchronous activity was contained

within the school's learning management system (Canvas). This study looked at a cross-section of the population of this particular degree program, diverse with respect to country of origin (nearly 75% of the program's enrollment is from China) and range of work experience (the researcher spoke with students just out of undergraduate and those with more than 15 years of professional experience).

The learning objectives for the research design course address the use of research techniques to reframe practice-based problems as research problems, to identify the appropriate sources of data for answering questions, and then to engage with findings to develop solutions that are sound from both a theoretical and practice-oriented perspective. Given that the study focused on adult learners with professional experience, there was reason to believe the problem-focused nature of this course would evoke connections to students' own practice-oriented problems and questions, contexts for application of course concepts, and constructs for interpreting and exercising course content. Documents analyzed in this study include readings, lecture materials defined by the instructor, and the text of assignments and rubrics.

As part of the study, student behavior and attitudes towards discussion were analyzed through survey and interview instruments; the aim of these instruments was to gather information that could be used to draw an activity system map based on student perception of the discussion activity and to analyze the specific behaviors exhibited when students moderate between their own learning goals and the instructor's learning goals. Adult student participants were identified for the study based on responses to the Self Directed Learning Inventory (SDLI), a validated instrument for assessing self-direction across four dimensions: self-motivation, self-monitoring, planning and implementation,

and communication (Cheng, Kuo, Lin, & Lee-Hsieh, 2010). Students who received high or low scores (upper or lower quartile) in any of the four factors were invited to participate in two interviews. Instructors of the three sections were also interviewed. Instruments are included in Appendix B and C, and are described in detail in Chapter III.

### **Assumptions of the Study**

This study relied on a set of assumptions about the population and their behavior before and within the learning environment. It was assumed, for example, that the student participants were reflective of the general population within the school of professional studies and continuing education at which the study took place. It was assumed that they came with prior professional experience (either full-time employment or internships) and goals from which to draw. It was further assumed that the students had the requisite English language skills to engage in asynchronous online discussion with other students in the class. Given that all programs at the school have an English language requirement (represented by a specified TOEFEL score for international students), there should be no concern about students meeting these basic requirements.

It was also assumed that students would be active participants in the discussion environment. In this context, active participation meant that students met three criteria. The first is that they would address all required components of the course assignment. A second assumption is that they would do so guided by a shared set of explicit and implicit rules about conduct in discussion. The concepts of felicity and cooperation in language have long been used by discourse analysts to suggest such basic principles are always present in discursive settings (Grice, 1975; Searle, 1976). The third assumption is that—



given appropriate conditions—students would engage in an exchange of concepts, contexts, and constructs as expressed in the research questions above.

The term *appropriate conditions* means that such participation and self-direction was encouraged and supported. In other words, the study also assumed that the instructor has designed and facilitated activities that support the development of a community of inquiry. Such a community is established, not naturally occurring. As this assumption represents a precondition for the data collection, assisting the instructor in establishing such an environment was an important part of the instrument construction and study design, and is explored in greater detail during Chapter IV.

Finally, it was assumed that artifacts of the discussion forum could be combined with interviews with the instructor and students to craft a comprehensive representation of the activity system. It was assumed students participated in these interviews honestly and candidly. Steps were taken to ensure that students understood their comments would not be shared with their instructors and that honest participation was important to the study.

### **Rationale and Significance**

This study was undertaken to explore how adult students participate in online discussion forums in order to understand how they make sense of, introduce, and focus learning goals that are different from those set by their instructor. The study is therefore aimed at understanding student behavior in a specific context. Because it uses a situated research framework that considers a range of factors impacting achievement of learning goals, the findings provide valuable information that can guide redevelopment and

instructional efforts for online discussion activities. Patterns have emerged, for example, that suggest different strategies for instructor intervention and facilitation or else that lead discussion prompts to be rewritten to promote more authentic dialogue. These are explored in Chapter VI.

Though there was no expectation for the study to yield generalizable results, it did result in a series of hypotheses (explored in Chapter VI) that could guide future research aimed at understanding student participation across contexts. Ultimately, this research can therefore be seen as the first step towards addressing a critical gap in research and practice related to how individuals introduce and interact around their own goals.

The implications for practice were expected to be similarly striking. If it is true, for example, that individuals must be taught to be self-directed, understanding the communicative and collaborative approaches to self-direction would enable new instructional methodologies and approaches that promote individual goal definition and fulfillment within a social learning context. If learners leave formal learning experiences with a new set of skills associated with lifelong learning, self-direction, and collaboration, they may enter into the world with renewed capacity for democratic engagement. In other words, providing a framework that explicitly links self-direction and collaboration may enable adult educators to build a more just and democratic society.

## Chapter II

### LITERATURE REVIEW

#### **Introduction**

This chapter describes current research related to the questions described above. In particular, the goal of this section is two-fold. The first is to describe a theoretical foundation that can frame the research study. The second is to define an analytical model under which such a study might be conducted. Therefore, the chapter will address both the ways in which prior research can assist in the development of a conceptual framework and the ways in which it presents a critical gap.

In the sections below, two topics are addressed. The first defines the theoretical paradigm and challenges present in research on online discussions. More specifically, the work of D. Randy Garrison and his collaborators (1997, 2000a, 2000b, 2003, 2017) is used to integrate the threads of self-direction and collaborative learning that are part of this study. Since Garrison's Community of Inquiry model has been converted to an instrument (Arbaugh et al, 2008) and subsequently validated (Banger, 2009; Diaz, Swan, Ice, & Kupczynski, 2010), it has been the subject of a many additional studies. These are also explored in this section. Self-directed learning is be introduced as a gap in the existing research in online discussion, and several models for addressing this gap are discussed. In the second topic, an analytical model called Activity Systems Analysis is introduced and discussed.

## **A Theoretical Framework for Analyzing Discussion**

A survey of research over the last half century suggests that the struggle associated with assessing the value of discussion as a teaching method is not a new phenomenon (Gutzmer & Hill, 1973; Ruja, 1953). Early research was “undisciplined and diffused” (1973, p. 5), focused on comparisons between discussion and lecture as teaching methods or the impact of discussion on subject matter mastery. Even with the introduction of online learning and the presence of online discussion forums, a key focus of the research in the early days of e-learning remained a comparison of discussion in its in-person (oral) and online (written) format (Hardy & Scheufele, 2005; Suthers, Hundhausen, & Girardeau, 2003). By the beginning of this century, online learning—and therefore, online discussion—was becoming increasingly prevalent in higher education; the confluence of learning systems and an educational setting that privileges pedagogy, assessment, and accountability sparked a need for more comprehensive analytical model for describing discussion in the context of online learning (Garrison, 2000).

### **Communities of Inquiry**

Garrison introduced a transactional theory (2000) in response to what he described as critical challenges facing educators in a complex, emergent distance learning environment. Garrison felt the only way to overcome these challenges was to “provide theory that will explain and anticipate education practices for a broad range of emerging educational purposes and experiences” (p 1). A transactional perspective asserts a focus on the teaching and learning exchange, noting that at its core, this should be “the

purposeful process of facilitating an outcome that is both socially worthwhile and personally meaningful” (Garrison, 2017, p. 15).

Garrison further suggested that an outcome of distance learning has been potential for a recalibration of responsibility and control over the learning process, noting that in an effective transaction the roles of ‘teacher’ and ‘learner’ become blended, with both having responsibility for constructing and confirming meaning.

The Community of Inquiry (CoI) framework was developed to describe cases where teaching and learning are seen as collaborative activities (Garrison, Anderson, & Archer 2000; Garrison 2017). For this reason, it is used here to represent the aspirations of collaborative learning activities that take place in asynchronous online discussions, where the promise is both shared responsibility over learning course content and shared responsibility for establishing direction and goals of conversation. Given Garrison’s emphasis on technology-based communication, shared ownership over learning, and self-direction—within another model to be described later in this chapter—his CoI model represents an appropriate framework for reviewing research on online discussion in the context of this study.

As proposed by Garrison, the CoI framework indicates that in cases of shared responsibility for both teaching and learning, three core elements are present.

The first of these is social presence, defined “as the ability of participants in the Community...to project their personal characteristics to the community, thereby presenting themselves as ‘real people’” (Garrison et al, 2000, p. 89). A challenge in defining the importance of social presence has been that much of the research on presence in virtual settings has been on the social-emotional dimensions, rather than on

enforcing the social role that individuals play in a learning and cognition setting (Garrison, 2017). The CoI framework suggests that shared academic identity—or identification with a shared academic goal—are reflected by open communication, group cohesion, and advancement of learning goals (2000, 2017).

A second core element is cognitive presence. The part of the model most directly related to the teaching and learning purposes of the model, cognitive presence is defined as the ability of participants to construct meaning through communication (Garrison et al., 2000). This is critical given the goal of the model is to engage participants in collaborative inquiry over particular subjects (2017).

Finally, Garrison said that a CoI is dependent on effective teaching presence. In the initial article (Garrison et al., 2000), Garrison described the “tutor behavior[s]” (p. 96) that influence student activity, including regulation of the content being covered, moderation style, and establishment of rules governing the construction of groups and teams. By the time of his update in 2017, Garrison was more specific in his language, noting the model was clear to define “teachING and not teachER presence” (p. 27). That is, the model rests on an assumption of shared responsibility for the teaching and learning responsibilities, and so all members of the community are accountable for this presence—though he does admit the enormity of the challenge associated with this goal.

### **Leveraging the Community of Inquiry Model in Research**

In 2008, Arbaugh established a Community of Inquiry Survey instrument to analyze discussions for the evidence of these three elements (Arbaugh et al., 2008). Since then, the model has been used to research the quality of interaction and design for asynchronous discussions in online learning environments. A search on the ERIC

research database using the simple search term “community of inquiry survey” identified 11 research articles that leveraged the CoI instrument produced between 2008 and 2016. Two of these 11 articles were research undertaken to validate the survey established by Arbaugh (Banger, 2009; Diaz et al., 2010). Five more of the studies leveraged the CoI survey as a descriptive tool in order to demonstrate the existence of a community of inquiry. One study used the model to draw conclusions about the evolution of the three elements over time, showing, for example, that as group cohesion increases, the need for open communication decreases (Akyol & Garrison, 2008).

Four of the studies are noteworthy because they attempted to draw qualitative conclusions about the effectiveness of specific learning activities by leveraging the CoI survey instrument. In a survey of 78 graduate students using three different social learning tools, for example, Wicks was able to demonstrate that students perceived greater degrees of cohesion and trust when using a synchronous wiki-based tool (2012). At the same time, the question of whether the community helps students to learn was left addressed only by student perception of their cognitive presence by the end of the course. This methodology is not uncommon in analyzing a community of inquiry. Archibald (2010) presented a study in which he tested student perception of social presence and teaching presence as predictors of perceived cognitive presence. This work was followed by Archibald’s dissertation, in which he used a qualitative review of student discussion to validate the CoI survey results. Archibald was able to identify metacognitive markers of cognitive presence within his qualitative analysis, such as students’ ability to make connections, recognize multiple perspectives, or define a learning preference (2011). But as with the other studies, students’ content knowledge was not within the scope of the

particular research questions. As a note, Archibald's work is also of particular interest here because his sample was taken from 10 online research design courses; a similar sample will be introduced in the next chapter of this study.

Stover and Pollack (2014) describe an instructor's successful efforts to build a CoI within an online history course, using the CoI survey as an instrument to verify that efforts were indeed successful. Yet the project also demonstrates a key challenge associated with the evaluation of discussion activities for adult learners, where more self-directed learners might stray from an instructor-defined path. In the following passage, Stover and Pollack describe an instructor's use of "breakout rooms" within a live webinar meeting:

In breakout rooms, students were given an allotted amount of time (usually 5-7 minutes) to discuss questions or prompts on a slide sent to the room by the instructor. The prompts were typically taken from the assigned focus questions and usually involved analysis of primary sources. Students were asked to evaluate the sources in terms of provenance, reliability, and credibility; to identify key passages and underlying assumptions; to evaluate the reasoning and logic of arguments in relation to the evidence marshaled; and to take a stand on a "fighting question" posed by the instructor. (p. 396)

The practice described falls easily into the definition of a Community of Inquiry, highlighting what Garrison described as the importance of establishing a shared social identity. "Social presence underpins collaborative inquiry and mediates cognitive and teaching presence. The primary reason students are there is to learn about a specific subject" (2017, p. 39). However, such insights raise questions about the degree to which the CoI model can be seen as consistent with more traditional definitions of self-directed learning.



## **Self-Direction and Self-Regulation**

Defining self-direction is important because it holds such different meanings for individual researchers. Whether self-direction is inherent or taught, a process or a quality, or if it requires students to define their own learning environment are debates that have confronted those interested in self-direction. This section of the literature review explores how these debates has manifested in the research; following this is a description of how it manifests more specifically in research on discussion.

Sze-yeng and Hussain said that SDL “refers to a learner’s autonomous ability to manage his or her own learning process, by perceiving oneself as the source of one’s own actions and decisions as a responsibility towards one’s own lifelong learning” (2010, p. 1913). The authors noted that in the context of program development, this meant providing students the opportunity to make decisions about their own learning. In establishing the environment, instructors established minimal scaffolding and allowed students to develop learning contracts and to build knowledge through collaboration. Sze-yeng and Hussain’s work is of particular note because they placed SDL in the context of a socio-constructivist learning environment in which “self-directed conversations with self and the community of learners is what contributes to meaningful and deep learning” (2010, p. 1914). In this example, the authors were attempting to understand the process by which students developed the capacity for and comfort in taking control of their learning environment. This research provides an example of more traditional definition of self-directed learning, though it also described a context in which students are forced to take such ownership. The researchers were not investigating the mechanics of the process, nor were they interested in the self-regulatory behaviors within the semi-

structured environment. This makes sense given the definition of SDL provided in the article.

Bonk and his colleagues (Bonk, Lee, Kou, Xu, & Sheu, 2015), referenced Sze-yeng and Hussain's work in crafting their own definition of SDL. They then attempted to take the definition a step further connecting their definition to the critical pedagogy promoted by Brookfield. The Bonk article suggests that Brookfield

...places emphasis in learners deciding on what to learn, when to learn it, how much to learn, and whether something has been learned well enough. From his perspective, the truly self-directed learner is empowered, not controlled by external decisions to acquire predetermined skills or negotiate through some heavily structured curricula. Learning decisions rest with the learner. (p. 350)

A similar set of elements is also seen in the literature on self-regulation.

Zimmerman described self-regulation as comprising of covert self-regulation (monitoring and sense of self-efficacy), behavioral self-regulation (adjusting performative processes), and environmental self-regulation (adjustments to environmental conditions) (1999). For its focus on the role of the self in a learning environment, self-regulation is often associated with self-efficacy, or the level at which a learner judges herself to be competent at performing specific behaviors or achieving outcomes (Shea & Bidjerano, 2010). Research suggests that self-efficacy may be a strong predictor of cognitive presence (Shea & Bidjerano, 2010; Shea et al., 2011).

SDL and SRL can be seen as complementary theoretical frameworks for explaining the relationship between internal and external dimensions of the self within a learning environment; SDL is focused on motivation and control over the learning process where SRL is largely focused on metacognitive and constructive processes (Pilling-Cormick & Garrison, 2007). An alternate conception was articulated by Saks and

Leijen (2014), with the authors suggesting that SDL comprises of planning learning and designing the learning environment, whereas SRL involves the learner regulation in cases where an instructor has planned the learning and designed the learning environment. For this reason, adult learning in a traditional learning environment may rely heavily on student self-direction *and* student self-regulation.

Another way to frame this debate over a definition for SDL is to consider two alternate ways of conceptualizing self-direction: as an organizing process or as a learner attribute (Narouzi, Hamid, Samet, & Ramezani, 2014). Accordingly, some researchers and practitioners consider self-direction as the way in which learners access the instructional process (Bonk et al., 2015; Slavit & McDuffie, 2013). Bonk, for example, was interested in how and why learners access existing instructional objects. Others are more interested in the study of how learners develop a capacity for and exercise the skills related demonstrating “intellectual, emotional, and moral autonomy” (Narouzi et al., 2014, p. 333). Sze-yeng and Hussain claimed that this is the goal of their research: to uncover how learners gain comfort and facility in learning within a self-directed environment. “Ultimately,” they write in their conclusion “it is the learners’ own responsibility to claim control of their own learning...Hopefully, all learners would positively embrace self-directed learning” (2010, p. 1917). This question of the nature of self-direction can in fact be rearticulated as a question about the inclusion of SRL: is self-direction an internalized attribute (SDL) or is it a way of personal meaning making in a defined learning context (SRL)?

One model that has attempted to bridge this divide is Garrison’s model for self-direction (1997). Differentiated from prior models by attention paid to the internal

learning process, Garrison's model addresses external management, internal monitoring, and motivational factors to define "an approach where learners are motivated to assume personal and collaborative control of the cognitive (self-monitoring) and contextual (self-management) processes in constructing and confirming meaningful and worthwhile learning outcomes" (1997, p. 18). In other words, such a model includes studying both self-direction and self-regulation—the study of how individuals assume control over their learning environment and understanding how they make personal meaning within a social learning context.

### **Self-Direction and Research on Discussions**

The multiple perspectives on self-direction—learners defining their own environment or defining interactions within an existing environment; self-direction as a process or as an inherent quality of adult learners—grow even more complicated when placed in the context of discussion. Given a multiplicity of perspectives on SDL, it is important that researchers define what they mean by self-direction prior to research.

Kim, for example, used discussion as a mechanism for reaching students in cases where a direct connection with faculty is difficult to achieve (e.g. large class sizes). Discussion is "suggested as an effective teaching method to find out how learners accept the learning outcome *as defined by experts*" (2015, p. 175, italics added). In other words, the researchers were identifying the capabilities needed organize their ideas and reach their own conclusions. "Discussion sparks students' interests, thus allowing them to participate in a self-directed way" (p. 177).

Kim's definition and associated methodology highlight that while the terms "self-direction" and "self-regulation" are often used interchangeably, they may mean very

different things in practice. The researcher intended to identify how interaction (with other students and with the faculty) and their self-directed “capabilities” might impact student learning, where learning is defined as the attainment of stated learning objectives. The author created an instrument in which a student’s self-described acceptance of an expert-defined objective was measured relative to their level of interaction with faculty and other students. Such a measure aligns with the researcher’s definition of self-direction, but would not align with one more interested in the study of self-motivation or goal introduction.

As discussed in Chapter I, this confusion between what self-direction of student-defined goals and the processes by which students achieve self-regulation of instructor-defined goals is one that seen frequently on research related to self-direction in discussion; many studies use definitions and methodologies that focus on the self-regulatory behaviors needed to address instructor goals (Horsley, O’Neill, & Campbell, 2009; Kim, 2015; Slavit and McDuffie, 2013). What is lacking is research on the use of self-directive behaviors to manage learning toward students’ own learning goals.

Horsley et al. (2015) noted that one difficulty in engaging in such a study is the surprising lack of connection between discussion and self-directed learning:

It is important to consider why group learning as opposed to a patient encounter is such an infrequent stimulus for personal learning. Is it because physicians and CPD providers view group learning and self-learning as separate and unrelated processes? If this were to be the case then this is concerning, as the literature on lifelong learning and reflection does not see personal and collective learning or reflection as distinctly different. (p. 96)

An alternative hypothesis may be that ‘collaborative self-direction’ is a contradiction in terms to students just as it has been for the researchers identified herein. Without explicit guidance for using the collaborative space to advance self-defined goals

and democratize the learning process, students and researchers alike struggle to find evidence of the strong connection between collaboration and self-direction. The rationale for this gap is explored further through this study.

### **The Self and the Community of Inquiry**

The introduction to self-directed learning above highlights the importance of individual goal-setting in the self-directed model. This area of study is captured in Garrison's model as motivation, which he described as playing "a very significant role in the initiation and maintenance of effort toward learning" (1997, p. 26). Yet in Garrison's later work connecting communities of inquiry to self-directed learning, this element of the model is conspicuously missing. Writing about his model in 2003, Garrison suggested that "the key dimensions are monitoring (reflection) and managing (action) the learning process" (p 5). Motivation was not listed as a key dimension.

The study of the three elements of the model predates their inclusion in a comprehensive CoI model. Social presence, for example, has been studied since the 1970s (Lowenthal & Dunlap, 2014); Garrison, himself, suggested that cognitive presence evolves from the work of John Dewey in the 1930s (Garrison, 2000; Garrison, 2017). It is not, therefore, unreasonable to think that there may be areas that have not been included in the model but which should be seen as part of one of the three elements. Indeed, some researchers have suggested that the CoI survey is itself incomplete (Kreijns, Van Acker, Vermeulen, & Van Buuren, 2014; Lowenthal & Dunlap, 2014). Yet at a more fundamental level, there may be a disconnect between the framework as defined by Garrison and the inclusion of self-direction as a component of the model. The concept of shared responsibility for transactional learning suggests that both collaborative process

and individual attainment of learning objectives be the target of assessment (Garrison, 2017). That is to say, both anticipated cognitive attainment and the critical thinking skills are targets, but not the individual student outcomes that are independent of the stated objectives.

A second suggestion has been that the model is missing a core element. For example, it has been argued that a fourth element—learner presence—be added to account for the importance of student self-regulation in the learning process (Shea et al., 2011). Research on course logistics, strategic efforts to divide tasks, and efforts to set collaborative goals are not directly considered as a component of any element currently in the CoI model and, as such, would be left uncoded in any textual analysis (the authors contend that since much of this work takes place outside of the learning management system, it was not identified in prior research). This model, too, has been rejected by Garrison. “The mistake of focusing on individuals and discrete roles is to risk crystalizing these responsibilities as embodied in the teacher or the learner” (2017, p. 159). These efforts, therefore, run counter the concept of shared responsibility that underscores the transactional model.

A final suggestion is absent in prior research: that the CoI model is complete, but is itself part of a much larger activity system that includes outcomes defined both independently and collaboratively by instructors and students. The hypothesis in this third alternative is that understanding communities of inquiry as a mediating variable within the social learning context—and not the context in toto—is key to understanding how both individual and instructor-directed goals are addressed. It is therefore this alternative that will be explored as part of this research study.

## Activity Systems Research

Increasingly, researchers are turning to activity systems analysis as a tool for exploring discussion and collaboration in the academic context. Case study methodologies that leverage discourse analysis are a primary methodology used, in part because activity systems analysis affords researchers the opportunity to define a detailed exploration of very complex systems.

Park identified as a core benefit of the activity systems analysis that it allows researchers to move from a surface analysis of technology use to a more structural perspective (2015). This structural approach could help researchers beyond simply recognizing the existence of communities of inquiry and towards an understanding of the ways in which the CoI is leveraged to mediate a students' pursuit of a given academic goal. For example, rather than identify the number of interactions or the degree to which students worked with pre-defined topics, Park noted the importance of chains of interaction, highlighting the role that each preceding comment has on the emergence of a series of smaller activity systems. This issue of connectedness was identified by other authors as well (Timmis, 2014; Yeo and Tan, 2014). Yeo and Tan further extended connectedness to include the embeddedness of subsystems within a given activity system. This particular feature of activity systems analysis has striking implications for the research noted above, if instructor goals, metacognition, and individual goals are all seen as potential objects in the discussion system.

A second emergent theme from the research on activity systems is the use of discourse as a key feature (Timmis 2014; Yeo & Tan, 2014). Rather than addressing the participatory and knowledge acquisition practices as distinct features, activity systems

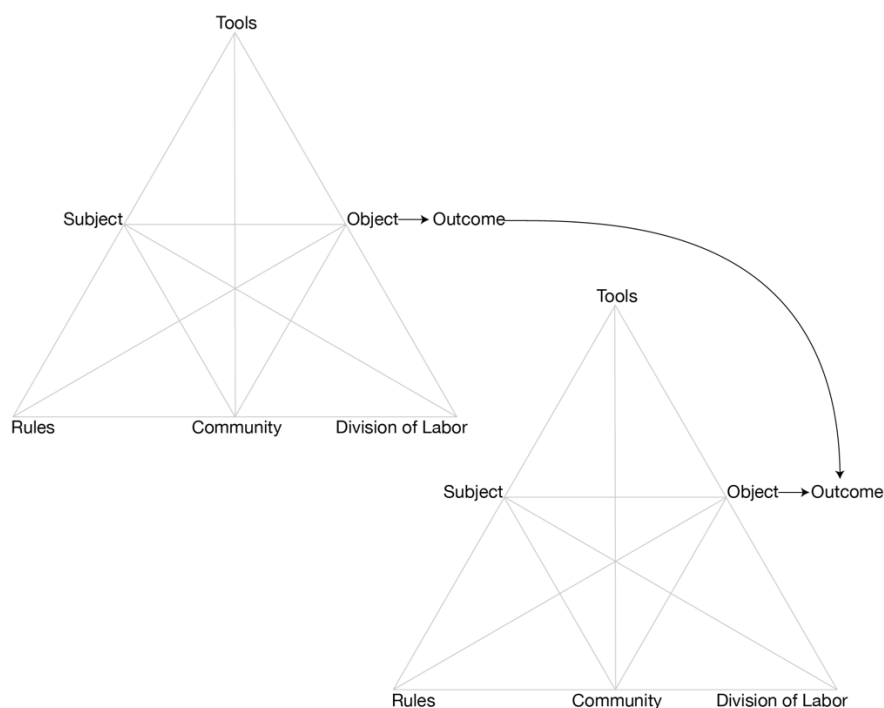


analysis creates an explicit bridge, linking these two student activities within the context of a social learning environment (Yeo & Tan, 2014). For the purposes of the research gap identified above, this linkage is vital; where other frameworks tend to suffer from a disconnect between a student's self-directed learning goals and her participation in a social learning context (Horsley et al., 2009), activity systems analysis insists on a researcher studying these two dimensions in relation to one another.

Yet in exploring this research, there is still inconsistency in describing the specified object or goal of in-class interaction. Park (2015), for example, conducted analysis of synchronous computer-based communication, and defined the object as discussion of class topics listed in the syllabus and discourse topics that emerged through discussion. Yeo and Tan (2014) described an object of problem-solving skills in their research of communication in ninth grade science classrooms. Lawrence and Lentle-Keenan (2013) defined the teaching goal as the primary object of discussion in their study.

The range of objects in these studies suggests the self-directed definition of anticipated outcomes for collaboration may itself be a complex system. An important feature of activity systems is that they can be nested or combined to explore additional complexities within systems. For example, the outcome of a particular activity system might lead to a new system or might define the rules or tools of another system. This is especially important because it is this feature of activity theory that make it an interesting analytical tool for understanding the self-directed goal setting behaviors of individual learners. Westaby (2012) noted that all communication within a group setting is intended to advance some sort of goal, though these goals can range from simple (to advance a

point of view) to complex (to get others in the group to take some sort of action on the speaker's behalf). A discussion can therefore be seen as comprising of two separate activity systems: one in which individuals set a goal for communication and one in which those various goals are negotiated. Within a discussion context, individuals may engage in some set of goal setting behaviors that draw on their personal experiences, reflection prompts, and capabilities for self-direction. The outcome of this goal setting activity is a particular goal or set of goals. Conceptually, at least, these goals are then introduced into the social system and are negotiated and realized as part of collaborative work with a learning community. At the point that the student engages in a collaborative attempt to achieve a given objective, the elements of a community of inquiry may become a mediating factor. Figure 2.1 might therefore serve as an illustration of an individual's contribution to a social setting.



*Figure 2.1:* Goal setting as an embedded activity

This schematic may serve to address the limitations described in the prior section by creating a model that draws a coherent connection between self-direction and collaboration. In this model, collaboration serves as a context for advancing a critical self-directed pedagogy, and self-direction serves as an input for collaboration. In addition, however, the perceptual dimension that is so prevalent in CoI research must be considered as a mediating factor within both the individual and community-oriented dimensions. Understanding how students perceive the activity system may therefore play a pivotal role in understanding how and why students engage within a community of inquiry.

### **Conducting Activity System Research**

A final consideration, then, is how activity systems research is conducted. Though observations and direct analysis of the learning environment are most frequently leveraged (Lawrence & Lentle-Keenan, 2013; Park, 2015; Timmis, 2014; Yeo & Tan, 2014), some studies also made use of semi-structured interviews to corroborate observations and to obtain student perceptions of the activity system (Lawrence & Lentle-Keenan, 2013; Yeo & Tan, 2014).

Yeo and Tan—attempting to understand the system that mediated student attainment of instructor-produced goals—interviewed both instructor and student participants in their study. The instructor was asked to explicate her intended goals, the strategies she had adopted to mitigate those rules, her evaluation of those strategies, and her perceptions of the outcomes. Students were asked to provide demographic information (including information about the prior education and examination results), about the tools that had mediated their learning, and “how they perceived their roles and

the norms of interaction” (2014, p. 758) had impacted their outcomes. In other words, the goals of the interview were (1) to corroborate an understanding of the activity system object, (2) to develop knowledge about the activity system subject, (3) to identify the intentionally-developed mediators within the subject-object relationship, and (4) to gain insight into perceptions about these mediating factors and their impact on activity system.

Lawrence and Lentle-Keenan (2013) were attempting to learn about the mediating tensions that provided a barrier to instructor use of technology in learning. Their participant instructors took part in semi-structured interviews. Though the specific questions posed in follow-up are not part of the interview schedule provided in their research, the authors noted that their research centered around three questions: (1) how and why technology was used by the teacher, (2) the relationship between technology and teaching, and (3) the factors influencing the instructor’s decisions to use technology.

As with Yeo and Tan (2014), Lawrence and Lentle-Keenan (2013) completed their research in order to: (1) corroborate an understanding of the activity system object (why would you use technology in the teaching process?), (2) develop knowledge about the activity system subject (preconceived impressions of the relationship between technology and teaching), and (3) gain insight into perceptions about these mediating factors and their impact on activity system (factors that influence decisions). The only goal from the Yeo and Tan research not also addressed in Lawrence and Lentle-Keenan was the investigation of intentionally designed mediators, as these were not aligned with the research context for their study.

Still, this research suggested a construction for an instrument that can help a researcher gain insight into an activity system. In other words, an instrument should

reveal both the intentionally designed and perceived qualities present in the activity system. Table 2.1 describes the information needed to develop a deeper understanding of these two perspectives.

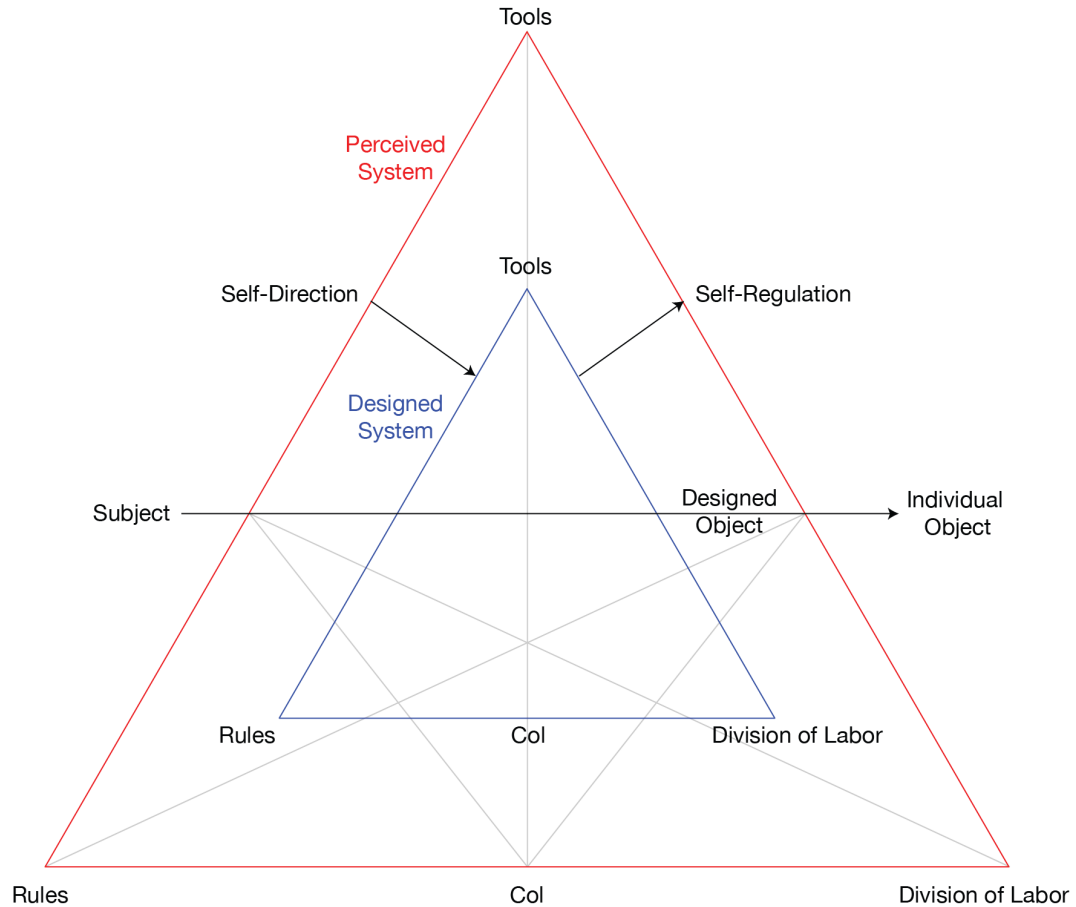
Table 2.1

*Collection Points for Constructing an Activity Systems Analysis*

	<b>Asked of instructor</b>	<b>Asked of student</b>
<b>Subject</b>	Perceptions	Data
<b>Object</b>	Class learning goals	Individual learning goals
<b>Mediating Factors</b>	Designed mediating factors and their perceived impact on outcome	Perception of mediating factors and impact on outcome

In practice, such information can be used to draw a single activity system from the point of view of the subject. However, the research described in this literature review also expresses a need for mitigation between the self and environment. As such, these two perspectives are treated as unique activity systems, with the perceptual lens representing the self and the designed lens represented the established, instructor-defined environment. Self-direction and self-regulation represent the mitigating forces between these two dimensions, allowing for behaviors that iteratively shape and reshape both the real environment and the learner's perceptions of both self and environment. This nested activity system lens is represented in the conceptual framework in Figure 2.2.

The framework in Figure 2.2 formed the basis of a semi-structured interview protocol for analyzing a learning activity system and for addressing the question of how these factors influence goal introduction and learning.



*Figure 2.2: Conceptual model*

## Conclusions

The Communities of Inquiry model provides a framework for understanding collaborative learning efforts in online learning. But as a model, CoI fails to address the concern that discussion be treated as a democratizing force within the learning experience; in fact, in a context of learning that is increasingly guided by regulation and accountability, discussions may be the most prevalent space for individuals to guide their learning experience through the introduction of personal learning goals that are independent or tangential to the prescribed learning goals from an instructor. Recognizing

communities of inquiry as a potential mediating factor in the attainment of individual and class learning goals requires the reconciliation of the CoI model with Cultural Historical Activity Theory (CHAT). When this study was authored, no research was identified in searches on the ERIC database or within Columbia University's CLIO search tool when using a combined Boolean of "Community of Inquiry" + "Activity Systems Analysis."

## Chapter III

### METHODOLOGY

#### **Introduction**

The goal of the study was to identify if, when, and how individuals engage in self-direction and self-regulation within a discussion environment. In developing an understanding of adult learner behavior in online discussions, the research attempts to address the following questions:

1. How do individuals make sense of their own goals for learning in the context of a formal, social learning environment?
2. How do motivation, monitoring, and management mediate the relationship between the instructor-designed and self-constructed activity systems?

As shown in the literature review above, answering these questions required the development of an analytical model for integrating self-directed learning with self-regulated learning and place them in the context of online learning. Such a model was necessary for studying student behavior in the mediation of personal and course learning goals. This chapter describes how such a study was conducted.

In the ensuing section, the case study methodology is introduced; an explanation for why a case study is most appropriate for studying the confluence of these two models is explored and information about the construction of cases is provided. The setting and sample for a multi-case study that provides a model for learning more about student



contributions is discussed. A technique for coding the data to enable analysis is considered. This chapter concludes with additional research considerations, including assurance of protection for human subjects, research validity, and limitations of the study.

### **Study Design**

Given that the nature of this research is to observe a particular phenomenon of learning in action, a case methodology was deployed. Yin (2014) suggested that a case methodology is appropriate for situations in which the research questions are asking how a contemporary event over which the researcher has little experimental control occurs. The questions above conform to such a definition. This particular study was a form of case study analysis called activity systems analysis. Activity systems analysis draws on Cultural Historical Activity Theory and provides a valid method for mapping complex data on human interactions within learning environments. Previous research has leveraged activity systems to identify systemic contradictions that impede learning or to develop guidelines for building learning environments (Yamagata-Lynch, 2010). As the goals of this research were to uncover student perceptions of and activities within a socio-constructivist learning environment, activity systems analysis was used for this study.

The literature review in the second chapter of this study described a number of studies that compare discussion outcomes to anticipated outcomes. While such research is useful for assessing the efficacy of discussion and for understanding student self-regulation within a defined learning system, it is not necessarily helpful for analyzing the more traditional elements of self-direction, such as learner motivation. The assumption that drove the design of this study, however, was that if researchers were able to draw

comparisons of approaches to discussion among students who display varying degrees of self-direction, it would be possible to understand the relationship between motivation, monitoring, and moderation behaviors inside the context of a social learning environment.

In an ideal environment, researchers would be able to control for all other variables, such as instructor goals, activity design, lecture materials, and facilitation patterns. In a natural research context, such control is recognized as impossible. For this study, all attempts were taken to make sure that students across multiple sections of the same course had the same learning experience. However, observation of the three sections revealed instructional idiosyncrasies that suggested the experiences may not be uniform. The instructor for one of the three sections, for example, joined WeChat—a chatroom used for “back channel” discussions of course content frequented by the majority Chinese population; the instructors in the other sections did not. The same instructor introduced participation rules (e.g. respond to at least two posts) in his live lecture session that were not part of the assignment description. Another instructor opted to rotate discussion groups midway through the semester. Yin cautioned that for reasons such as these, case study researchers must “beware of these types of cases—none is easily defined in terms of the beginning or end points of the ‘case’” (2014, p. 31).

In the case of research on discussions, identifying boundaries is particularly difficult. For example, in attempting to engage in research concerning student behavior in discussion, it can be unclear if the behavior is one introduced by a student’s prior experience or if the instructor has requested the behavior in some informal context, such as WeChat or live lecture. One student in the study expressed that she could not

remember if a rule she was following was even set by the instructor, saying it is possible she was carrying it into this discussion from another course entirely. This makes identifying both the beginning and end point of a discussion particularly difficult.

The prior chapter demonstrated that an activity-theory informed case study methodology is a frequently-used mechanism for exploring discussions (Lawrence and Lentle-Keenan, 2013; Park, 2015; Timmis, 2014; Yeo and Tan, 2014). Given the availability of data, such cases studies were generally treated in one of two ways. Either subjects in the study were analyzed as part of a single class or cohort, or else they were considered as unique cases that were first analyzed individually to define rich, thick descriptions and then cross-analyzed to define themes and findings. For example, Ryder and Yamagata-Lynch (2014) analyzed pairs of learners before defining a single activity system structure for high- and low-functioning groups, while Lawrence and Lentle-Keenan (2013) defined individual narratives for the students in their study prior to summarizing themes and tensions related to learning beliefs and experiences. Of these two models, only the latter addresses the concern expressed above about about differences introduced across different cohorts of the same class; the high probability for individual difference dictated that the individual participants in the study were to be treated first as unique cases. These cases were then analyzed for themes and patterns that will appear in Chapters V and VI. Further exploration of how these cases were coded is provided in the following sections.

## Discussion of the Setting

This study takes place in a recently-launched Master's degree in analytics management at a school of professional studies and continuing education. Despite an enrollment of over 300 students, the program has made an effort to keep class enrollment capped at approximately 50 students per section, meaning that required courses therefore had 6-7 sections each.

In their first semester of the program, all students must take Research Design in either an online or face-to-face format. Research Design provides a comprehensive introduction to approaches to research design. The goal is to help students develop a framework for asking questions, collecting relevant evidence, and defining evaluation strategies that can be leveraged in a professional setting. Because some students came into the program prior to this sequence being required, there were some enrolled students at the time of this study who had opted not to take the course during the first semester. That meant they were taking the course in their second fall of the program; for part-time students this was approximately half way through their study, though there were also full-time students who were taking the course during their final semester.

All online courses at the school (including Research Design) have a required weekly synchronous class session. For flexibility sections are spread throughout the week, so a section labeled S02 might meet each Tuesday from 6:30 to 8:00 pm while section S03 meets every Wednesday from 8:30 to 10:00 pm. Preference for section enrollment is based on the number of years of professional experience. For example, section S01 was opened only to students with more than five years of professional experience. However, these students were also allowed to enter any other section if they

preferred a different time, modality (such as face-to-face), or instructor. One limitation that occurred in the semester that this study was conducted is that two high-profile instructors offered sections in a face-to-face format, reducing enrollment in the online sections. Students with at least two years of experience were invited to join a waitlist for the course which was opened when enrollment in section S01 did not hit maximum capacity. As listed in Table 3.1, three sections of Research Design were offered in an online format (S02, S01, and S03), with a total enrollment of 102 students.

Table 3.1

*Enrollment by Section and Instructor (Using Pseudonyms)*

<b>Section</b>	<b>Instructor (pseudonym)</b>	<b>Time</b>	<b>Enrollment</b>
S02	Patton	Tuesday, 6:30 – 8:00 pm	49
S01	Hellen	Tuesday, 8:30 – 10:00 pm	10
S03	Mel	Wednesday, 8:30 – 10:00 pm	43

All instructors hired to teach the Research Design course were given access to the same set of materials and were provided instructions that they must follow all lecture structure and facilitation guides. As noted above, however, instructors did deviate in ways they felt would have a positive impact on student learners. Instructors were also permitted to draw from their own professional experience to illustrate concepts in the course. Though most of these changes appear minor, they may impact the ways in which students complete instructional activities, and are therefore considered in the analysis below. Despite these differences, students across all three sections have a consistent experience with respect to content coverage, activity design, grading, and facilitation.

## Discussion of Sample

The students who were part of this sample were adult students in a Master of Science degree in analytics management. The program is aimed at the growing population of professionals across various industries who must leverage analytics to make key business decisions and recommendations. The program is not for analysts themselves, but rather it develops those who will manage analysts and need enough analytical skill to interpret findings and communicate them to senior leadership. Students come from a variety of industry sectors, such financial services, marketing, publishing, consulting, and biotechnology. Typical applicants have some degree of professional experience, with the average student currently possessing less than two years of experience (range 0-20 years). The program's content is sufficiently broad that students can apply the models taught in each of these contexts, and this manifests itself in students having a variety of professional interests and problem types they are attempting to address.

Despite its size, admission to the program is highly competitive. As part of the application process, all students must demonstrate that they are prepared to take courses in English. This is important because the program's population is heavily Chinese (74%). Only 12% are domestic students from the United States. For non-native speakers of English, a TOEFL score of 100 (online) is required for admission to the program; conditional approval may be granted to non-English speakers who score between 90 and 100, but these students must take a pre-enrollment English course and retake the exam in order to be fully admitted.

All 102 students in the three online sections of the Research Design course were invited to participate in the study. During the semester, students were invited to complete a survey of their experience participating in online discussions in the class. The first 20 questions of this survey were taken from the Self Directed Learning Inventory (SDLI), a validated instrument for assessing self-directedness in learners. Cheng, Kuo, Lin, and Lee-Hsieh developed the SDLI to create an instrument that addressed readiness for self-direction across four primary domains: self-motivation, self-monitoring, planning and implementation, and interpersonal communication (2010). In this way, it includes elements of both SDL and SRL as defined in the preceding chapters. The instrument was developed through an investigation of five existing instruments for assessing SDL, including Guglielmino's Self-Directed Learning Readiness Scale (SDLRS) and the Williamson self-rating scale of self-directed learning (SRSSDL). Because the instrument was initially developed for assessing the readiness of nursing students, each item in the five instruments was evaluated by 16 experts, six experts in adult education and ten experts in nursing education. These experts independently rated the assessments for appropriateness (ability to measure self-direction), representativeness (expression of core SDL concept) and explicitness (clarity). Duplicate items were removed and items that received poor ratings from the panel were deleted. The result was a 20-item instrument that cut across four domains was identified. Concurrent validity with the source measures has been undertaken to ensure that the SDLI is a valid instrument that measures the same factors as the longer-form instruments. Shen, Chen, and Hu (2014), for example, found that the SDLI results were consistent with SRSSDL ( $r = .876, p = .000$ ). These results were confirmed by Cadorin, Cheng, and Palese (2016). Because it was initially developed

for nursing students and only validated for this audience in the recent past, the SDLI tool has infrequently been used outside of medical education. However, it has been demonstrated as an effective instrument for researching self-direction in other contexts as well (Miller, 2014).

Table 3.2

*SDLI Score Distribution of Student Responses (n = 22)*

<b>Factor</b>	<b>Minimum</b>	<b>Lower Quartile</b>	<b>Average</b>	<b>Upper Quartile</b>	<b>Maximum</b>
Self-Motivation	18	23	25.6	28	30
Self-Monitoring	21	22	23.9	25	30
Planning and Implementation	10	14	15.2	16	20
Interpersonal Communication	9	15	15.6	17	20
Total	58	77	80.2	85	100

22 students responded to the SDLI survey. From these responses, the boundaries for the upper and lower quartile of scores for each factor were identified. These distributions are included in Table 3.2. Any student respondent whose score was in the upper or lower quartile for any factor was contacted and invited to participate in the study. 21 of the 22 respondents appeared in the upper or lower quartile in at least one of the four categories and were therefore invited to participate. Students were told that if they engaged in two interviews (following weeks 8 and 11 of the semester), they would be given \$20 to thank them for their participation.

Nine of the 21 students agreed to participate in the study. Of note in the sample is that some students had high (or low) ratings across multiple factors, while others did not. Some students, in fact, had high ratings in some factors and low ratings in others. This



distribution—shown in Table 3.3—gave further voice to a concern raised earlier in this chapter: with so much variability across participants, defining a single activity system that describes the perceptions of all students would be impossible. Instead, the study would engage in developing each individual as a unique case before exploring themes that cut across the cases.

Table 3.3

*Participant SDLI Scores (Using Pseudonym)*

*(note + or – indicates within the upper or lower quartile range)*

<b>Name</b>	<b>Motivation</b>	<b>Monitoring</b>	<b>Implementation</b>	<b>Communication</b>
Wendell		+		
Starla	-	-	-	+
Merrill		-		
Howard	+		-	-
Rosemary		-	-	
Peyton			-	
Grover			+	+
Jaylee	+	+		-
Amberly	+	+	+	+

Though the student sample was small, it did include individuals with both high and low scores across each of the four factors. The group was also demographically similar to the general population of in the analytics management program with respect to age, years of professional experience, and nationality. Table 3.4 illustrates demographics of the general population for students entering the program in Fall 2016 and the distribution of students in the sample. In general, samples within an activity systems analysis are small when compared with samples in other forms of qualitative analysis

(Yamgata-Lynch, 2010). Instead, activity systems researchers are concerned with the depth of understanding about the activity system that they are able to uncover.

Table 3.4

*Demographic Distribution of Sample and General Program Population*

	<b>All students</b>	<b>Sample</b>
Percent under 24 yrs old	56%	66%
Percent with professional experience (3+ years)	21%	33%
Percent from China	74%	67%
Percent Domestic	12%	22%
Percent International other than China	14%	11%

In addition to these individuals (for whom a pseudonym appears in Table 3.3 above), the instructors for sections S02, S01, and S03 were also considered part of the sample.

### **Methods for Assuring Protection of Human Subjects**

The research conducted as part of this study is an examination of a common educational practice (use of discussion in online courses) and therefore posed minimal risk to student subjects. Still, students were given multiple opportunities—at different stages of the study—to opt out of participating.

At the beginning of the course, students were told that the content of their discussion was being monitored as part of a research project. Because the discussions were a part of their class experience, they were not given the opportunity to opt out of participation. However, if students wished, they could opt out of having their data

included as part of any data collected at the end of this study. The researcher attended the first class session to explain the nature of the risks associated with having data included. Students were told that their participation would in no way impact their grade and were assured that no information about their participation would be shared with the instructor or any other party that could impact on their grade. In total, five students across the three sections opted out of participating in the study. No data from these students appears in this study.

Students whose SDLI scores were in the upper or lower quartile for any of the four SDLI factors were invited via email to participate in an interview and given an additional opportunity to opt out. Nine of the 21 students who received invitations agreed to participate. Information about the research study was included in the invitation to interview, and a second consent form informing them of this right to opt out was presented to students before each interview. In addition, students were told that their names would be changed before the research was published or shared with the faculty. As with the survey results, students were told that no identifying information would be shared with their faculty in advance of the semester concluding. Interview sessions were audio recorded; subjects were informed of this audio recording and were again be given an opportunity to provide consent or opt out of participation. Subjects who did not wish to be recorded were told they would not be allowed to participate in the research. All participants consented to being recorded. The consent form for participation in the survey and interview is included in Appendix A.

### **Areas of Information Needed**

Yin (2014) suggested developing propositions based on research questions. These propositions should represent the theoretical principles on which the research is based. In other words, the research undertaken in a case study should be aimed at addressing the veracity of these claims. Propositions aligned to the questions in this study included:

1. Goals for collaboration are initially surfaced by faculty designers and built either implicitly or explicitly into discussion prompts. (RQ1)
2. Goal attainment is mediated through the use of tools, rules of engagement, practices of the community, and division of labor; these can be readily defined through observation and discussion. (RQ1, RQ2)
3. Students and faculty seek opportunities to align their own goals for collaboration, which may be mediated by the same structural elements. (RQ1, RQ2)
4. Another activity system design may be necessary for fostering the use and adoption of concepts and constructs initiated as part of individual goal-introduction behaviors. (RQ2)

In order to develop a more comprehensive understanding of the goal-setting and communication behaviors enacted in the discussion space, evidence for each of the four propositions listed herein needed to be collected.

It should be noted that the list of propositions also included rival propositions that may address concerns about validity and applicability in other situations. For example, Proposition 3 states that a similar activity system design may enable the individual goal

setting and collaboration being investigated, while Proposition 4 suggests that an alternative design may be necessary. At least in theory, addressing both of these propositions should have allowed for the development of new theories and models that can be tested in future research.

Table 3.5

*Propositions and Evidence Collected*

<b>Proposition</b>	<b>Evidence collected</b>
1	<ul style="list-style-type: none"> <li>• Interviews with instructor as part of this process</li> <li>• Collection and analysis of discussion prompts downloaded from the learning management system</li> </ul>
2	<ul style="list-style-type: none"> <li>• Analysis of data (discussion board postings) downloaded from the learning management platform</li> <li>• Survey response data</li> <li>• Student interviews about perceptions of the learning environment</li> </ul>
3	<ul style="list-style-type: none"> <li>• Student learning outcomes</li> <li>• Analysis of completing discussion</li> <li>• Survey response data</li> <li>• Interviews with select students about goal introduction</li> </ul>
4	<ul style="list-style-type: none"> <li>• Student interviews about perceptions of the learning environment</li> </ul>

Table 3.5 identifies a model and methodology for gathering data related to each of the propositions. The multi-tiered data collection and analysis methodology is explored in greater detail below.

### **Methods for Data Collection**

The questions raised in this research addressed student perception of online asynchronous discussions, and in particular attend to student understanding and

introduction of their own learning goals into a social learning system. This goal—and the accompanying theoretical framework introduced in Chapter II of this study—indicated a need for understanding (1) how social learning activities are designed, (2) how participants perceive these activities, (3) how participants perceive their own goals, and (4) how they engage in the activities as a result of their own perceptions.

It has already been shown that an activity systems analysis is ideal for describing the complex system in which individual, instructor, and group learning goals are mediated. Yamagata-Lynch (2010) provided a framework for considerations related to the collection of data for activity systems analysis. Her research suggested that in order to achieve a holistic view of the activity system, multiple collection mechanisms must be used. This is because the goal of the researcher is to “make sense of, and become able to report participants’ lived experiences” (p. 65). This means that a researcher must understand the environment, the subject, and the relationship between subject and environment. This calls for data collection methods that provides the researchers’ impression of the research context (observation, data analysis) and the subjects’ impression of the context (interviews).

The goal of data collection in an activity systems analysis is to witness participants engaging in object-oriented activities. In the case of this research, there was an interest in observing engagement in object-oriented activities both in which the object was determined by a faculty member (e.g. the activity goals established by a faculty member) and in which the object was determined by the students themselves.

Yamagata-Lynch suggested that interviews in an activity systems analysis are useful because they reveal the subjects’ impressions of their settings in their own words.

They provide, therefore, an understanding of how individuals within the system perceive the rules and tools available.

All participants in this study were interviewed twice, after the eighth and again after the eleventh week of the course. Prior to interviews, the discussions in weeks 3, 8, and 11 of the course were reviewed by the researcher. Field notes were authored to note patterns of behavior, especially among students who would be participating in interviews. Examples of behaviors that were noted include patterns related to timeline (was the student always the first person to post?), format (did the student's posts follow similar structure?), activity type (did the student always agree with other students?), and topic (did the student address the instructor's questions?). In addition to these observations, all participants completed a survey in which they described their initial impressions of the designed activity. This survey protocol is included as Appendix B. Although there was a detailed interview schedule (Appendix C) observational and survey data both influenced the structure of the interviews.

Because this research was interested in conditions that enabled a specific type of interaction, the interviews needed to attend to how students made sense of their own goals and their own engagement behaviors. In particular, the questions were aimed at uncovering students' perceptions of the activity system at the point of participation. Questions asked students to define their own goals and the conditions—as they perceived them—under which those goals were realized. For example, students were asked questions about the roles that they and others took up in the discussion; they explained how they felt the technology used for discussion enabled or inhibited participation; they

discussed how they interpreted any rules of engagement as defined explicitly by their instructor or implicitly by other members of the discussion group.

Table 3.6

*Summary of Data Collection Methods*

<b>Summary of Data Collection</b>	
Study population	Students enrolled in one of three online sections of a Research Design course in an MS program in analytics management. There were 102 possible participants (enrolled students) across the three sections.
Sample selection	All students were invited to complete a survey that included a validated measure for assessing self-direction across four dimensions: motivation, monitoring, implementation, and communication. Students in the upper and lower quartile across any of one of the four dimensions was invited to participate in an interview. 21 students were invited to participate. Nine students agreed to be interviewed.
Study design	The study was a multi-case analysis that reviews each student participant as a unique case. Activity systems analysis was used to provide rich, thick narratives about student goals and goal introduction. A cross-case analysis was then used to define themes and patterns.
Document Analysis	Documents include instructor resources, such as the discussion prompts, syllabus text, and rubrics. Document were used to help define the “designed system,” which is described in Chapter IV. In addition, students reviewed the documents in the interview and described their own understanding of instructor goals.
Observations	Observation of student activity occurred in weeks 3, 8, and 11 precedes the interview. These were reviewed during the interview. For example, if a student suggested in an interview they routinely challenge others, the protocol called for the interviewer to review the discussion with the subject to identify examples of the behavior in practice.
Survey	See Appendix B.  The optional survey ran twice during the semester for all students in the population, after weeks 3 and 8. The survey was divided into two parts. The first asked the students to complete the SDLI. The responses were used to define a sample. Answers to the second set of questions were combined with observational data to help structure the interviews.
Interviews	See Appendix C.  Students who agreed to participate were asked in depth questions about their participation in the class discussions. Nine participants were each interviewed twice (total of 18 student interviews). Three instructors were also interviewed.



The interviews were intended to delineate tensions within the activity system and also to differentiate between the behaviors observed by the researcher and those described by (or perceived by) the participants. Based on the theoretical framework presented in Chapter II, interviews were also used to delineate tensions between the activity system as experienced by the student and as defined by the instructor through the design process referenced earlier in this chapter and described in detail in Chapter IV. Finally, interviews were used to define how the student navigated these cross-dimensional tensions. Therefore, these interviews were semi-structured, and the protocol was based in part on the students' actual participation. A copy of the interview protocol is provided in Appendix C. A summary of all sample identification and collection methodologies used in this study is included in Table 3.6.

### **Methods for Data Analysis and Synthesis**

The data collected during observations, surveys, and interviews was used to define an activity system. An important distinction must be drawn in that activity system research is not in and of itself an analytical method. Yamagata-Lynch (2010) noted that while some researchers have attempted to apply activity systems analysis as a deductive methodology, using the model to restrict which data is explored would limit the richness of potential findings present in the data. Instead, she recommended an inductive, grounded approach to identifying codes which can then be categorized according to the activity systems model.

Strauss (1987) suggested a constant comparative method of coding. The method allows for both the grounded, inductive methodology while simultaneously affording the

researcher the ability to structure the coding according to a prescribed schema (in this case, activity systems analysis). In this research, a modified form of this approach was used to provide the open nature of Strauss's method while ensuring that research was aimed at addressing the research questions posed.

First, interviews were transcribed and placed in Dedoose. Dedoose was selected for ease of use in coding and for its power as a data storage and organization tool. The Dedoose research project contained transcriptions of both the first (week 8) and second (week 11) interviews. It also contained the transcribed interview of the instructors of the three sections.

### **First Cycle Coding**

The initial coding of transcribed interviews was open, descriptive coding. Effort was made to leave the coding as open as possible. Open coding is so termed because there are few restrictions, but also because "the aim of the coding is to *open up* the inquiry" (Strauss, 1987, p. 29). In this stage, the data is explored to produce concepts that fit with the data. Yamagata-Lynch (2010) suggested the development of code table in which the open codes are defined and refined. Within Dedoose, each code was defined as it was applied. When a new excerpt was identified and existing codes did not apply, a decision was needed: should the code definition be refined or was a second code required? For example, the following excerpt was coded with an open code "course goal."

Starla: When I was reading the completed research by other authors, I think it's awesome and I never thought that I could [sic] finish it. One day I might finish it. That's what I think the goal is for this course.

This code was defined as a “student expression of rationale for completing Research Design course; explanation of what they hope to get out of the course.”

Later—when reviewing the discussion from the third week of the course—Starla said the following about bringing in her own work experience into the discussion:

Say, that week, the NCRCC showed me—it’s about the list of the research, the structure of it, so we don’t have much space for our own experience, nor did the teacher ask us to share because we are supposed to focus on solving the problem he proposed, related to the book knowledge.

Such an excerpt is clearly about goals, but does not fit neatly into the definition listed above because it is not about the Research Design course in its entirety. There was therefore a need to either refine the definition to be more inclusive, or else to add a new code. In this case, the nuance seemed important, and a code to capture “task goal” was created.

As another example, the code “long-term connection” was used to describe a student’s referring to lasting relationships. After Starla’s description of “close relationships” became a code, the “long-term connection” code description was changed “student references to personal connection from the temporal perspective.” The name of the code was also changed to “long-term relationships” to highlight the connection to the “close relationships” code. Ultimately, “close relationships” was merged to “friendship and relationship” because there was no reasonable distinction among these two codes.

During this first cycle coding, codes were combined and names were changed as data analysis continues. Strauss (1987) also offered that coders should not forget the questions that they are trying to ask of the data. The aim of open coding is to analyze the data minutely, not to address an overview or patterns in the data.

Descriptive codes also acted as a shorthand to describe the sentiment or act being discussed in a phrase, sentence, or entire student passage. For example, in his interview, Peyton said the following in talking about the impact of responding to other student's posts:

I think we may just talk about this a little deeper, because sometimes it may be the fact that [another student] will not agree with my addition to her idea, and think that there may be some problem with my idea. So I think I'd like to have some discussion with her.

In this case, the codes "value," "disagreement" and "collaboration" were applied, with an attached memo noting that for this participant, the following rule applied:

*value (new idea) + disagreement → collaboration*

Any time a new code was added, it was defined; new codes needed to be either defined with sufficient difference to warrant a second code or merged into an existing code (in which case the definition was usually amended). If a new code was added in subsequent interviews, all preceding interviews needed to be reviewed with the new coding list.

Yamagata-Lynch suggested that open coding continue until the data saturated, and no new codes can be identified in the data. She noted that the goal at this stage is simply to refine the code definitions until all mutually exclusive codes have been identified in the data.

After five participants (ten interviews), the coding reached saturation. All subsequent data was able to be coded using the codes that existed at that time. The final code list included 87 unique codes. A list of codes and definitions is included in Appendix E.

## Second Cycle Coding

To develop the map, each of the codes was reviewed for its best fit with the structural elements of the activity system model and the SDLI instrument. These are defined in Table 3.7 below. Within these divisions, codes were organized hierarchically or categorized as needed. An activity system researcher would here leverage the Engeström's model by categorizing the codes to address the specific questions posed by activity systems analysis. This include questions such as: (1) what is the object? (2) what tools, rules, division of labor, and communities are involved? (3) what tensions exist?

Table 3.7

### *Initial Structural Codes*

<b>Initial Structural Codes</b>	
Activity Systems	Rules, Tools, Division of labor, Community
Self-Directed Learning	Motivation, Monitoring, Management

## Narrative Development

The end product of such an analysis was two-fold. First, a comprehensive model was defined to describe the activity system as it was experienced by individual students and faculty. More importantly, a narrative interpretation of the system by the specific actors who engage in goal-setting behaviors was established. A sample of one student's activity map is show in Figure 3.1, and will be described in greater detail in Chapter V.

Yamagata-Lynch (2010) reminded readers that the role of activity systems researcher is one of storyteller.

In activity theory research, this role as a story teller is important because the activity systems analysis is based on this story. Therefore, in my own work I strive to provide a thorough account of how I engaged in the qualitative data analysis process and provide a thorough narrative that summarizes participant experiences. Without this

narrative or thick descriptions of the data, the reader will have nothing to use as a source for engaging in their own activity systems analysis of the data to assess the trustworthiness of the investigator's work. (p. 72)

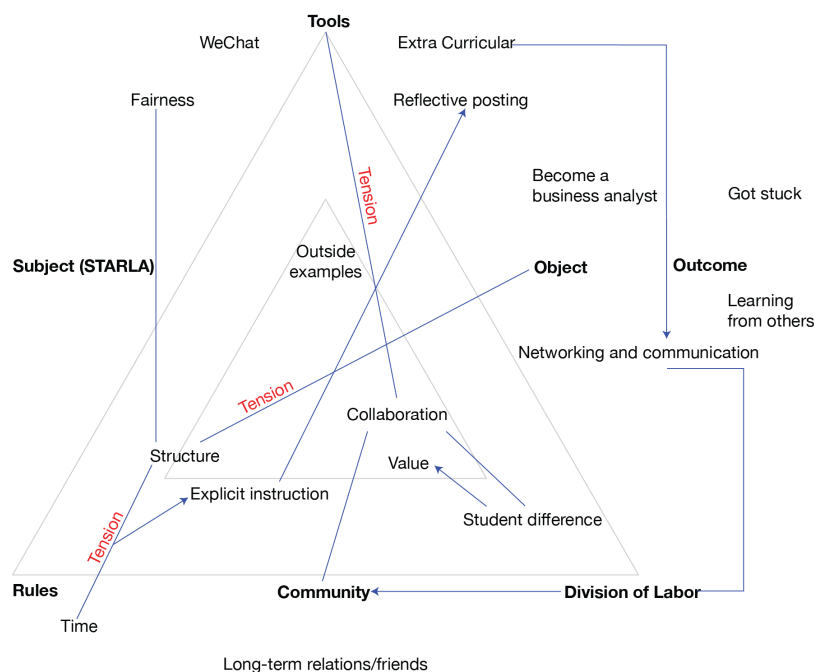


Figure 3.1: Activity system defined for Starla

Themes across these narratives were then defined. These themes identify the tensions present in student perceptions of the activity system (related to RQ1) and the mediating behaviors used by students to direct their own learning (RQ2). It was important that the theming be completed across narratives because the setting was a social learning context, and there was interest in understanding the impact that one participant's actions have another. For example, the following excerpt is from an interview with Jaylee.

Jaylee: I think discussions in an online setting, particularly in a class online setting are different than our in person ones because one, I think we take them a lot more formal. Just in the way we address each other, the way that we talk about things. They're just so more formalized because it's like when we're in person, we're just definitely a bit more laid back and casual about how we go about discussing the topic.

Brian: What do you mean by formal? Can you describe that in a little bit more detail for me?

Jaylee: When we talk to each other in discussion group, we always just from what I've noticed, everyone addresses each other like, "Hi," like you're writing a letter. "Hi, Jaylee."

Another participant, Amberly, raised concerns over the functionality of the discussion tool in her interview:

Amberly: If multiple people reply under a post you cannot reply to them one by one.

Brian: It shows up at the bottom?

Amberly: Yes it's just added to the bottom. You can't reply to them one by one. If let's say three people leave a comment and you would like to reply to the first person that made the comment. You have to go to the very bottom and then hit the reply and then I have to say, "Hi Tom." And then Tom was like, "You are replying to me."

At face value, Jaylee's concern might have been attributed to student communication behavior. Amberly, on the other hand, was clearly talking about the functionality of the discussion tool. Yet it became clear when reviewing their narratives side by side that there was a tension between tool functionality and expected behaviors for communication and discourse. In other words, cross-case theming was a required final step of the analysis. In so doing, an emergent theory of activity systems design that accounted for learner self-direction in the context of discussion was created. This coding and theming is explored in greater detail in Chapter V.

### **Methods for Assuring Validity and Reliability**

A key question concerning the validity of the data was whether the three sections of the Research Design course (S02, S01 and S03) were homogenous. As noted above,

Yin highlighted the difficulty in defining the beginning and ending of cases (2014). If discussion was indeed the unit of analysis across three sections of the same course, there needed to be a degree of consistency across all offerings that would allow a researcher to draw conclusions about what was happening in the case. Such a concern was mitigated by being discrete about the unit of analysis for the case. Because the three instructors have been interviewed, the designed system that comprises the center of the theoretical framework can be switched out depending on which section the student participant is coming from. This means that themes in the data were determined based on the student's perceived relationship to their specific designed system, reducing the need for homogeneity across sites.

A second method for validity is data triangulation, which occurred here by collecting data from different sources and at different times. The multiple collection points provided opportunities for the researcher to explore patterns of behavior that occur over several weeks in the semester, meaning that the investigation is not restricted to student behavior on a single activity. In addition, the use of multiple collection methods—including surveys and observation of student behavior—provided additional validation. On multiple occasions during interviews, there was a clear disconnect between what the student described as actions taken and what was witnessed in the observation. These have been noted in the case descriptions that are included in Chapter V.

A third method for ensuring validity is the production of rich, thick descriptions for each case. Such descriptions are a requirement of an activity systems analysis and are



present for each case in Chapter V. These allow the reader to evaluate the validity of the themes and findings by comparing them to the descriptions for individual cases.

Finally, member checking was used to ensure validity. Participants were provided a summary of the findings for the study and were asked to provide input into whether the conclusions were reflective of their own experience.

### **Limitations**

A key limitation of the research method is its small sample size. To attract a larger sample, students were contacted several times and offered a small honorarium (\$20) for participating. Though more students did agree to participate after they were offered money, there was still a small number of students willing to be interviewed. This was especially interesting because 22 students participated in the survey, which they were told might lead to an invitation to interview; yet 13 of the students who completed the survey did not respond to requests to be interviewed. This may be because interviews for this study coincided with significant due dates in the courses (assignment drafts were due at the end of weeks 3 and 8; final drafts were due in week 13). It is possible students were willing to complete the survey and then found themselves busy with the assignments in the course. Interestingly, this underscores one of the systemic tensions that will be discussed in Chapter V.

Yamagata-Lynch (2010) identified several criteria for selecting participants in an activity systems analysis, noting that the number of participants in qualitative analysis is relatively small but that the need for understanding how they engage in an activity system is significant. She urged researchers to identify a sampling protocol that is aligned with

both the theoretical background of the study and the research questions posed. In the case of this study, the SDLI provided a mechanism for securing a diverse range of perspectives among a small group, and the analytical methods ensured a depth of understanding of each case that enabled the research questions to be substantially addressed.

A second limitation of the research method was a reliance on a single researcher to define the codes during the data analysis phase. It is therefore possible that some potential codes were missed or else redefined during the axial coding process. The role of multiple data points (SDLI scores, grades on aligned course assessments, and matched sample interviewing) was to triangulate the data in order to mitigate risks associated with this limitation.

In addition, while the research has resulted in several hypotheses about how discussions can be reconstituted to promote goal setting behaviors, testing these theories is considered outside the scope of this research project. It is the hope of this research that this study becomes the first phase in a larger initiative to understand student behaviors and to promote discussions as a space for adults to focus their personal learning.

Finally, an important limitation is the author's own role in the research context, having participated in the development of the course in which the research takes place, and having been active in discussions about the program's design during the time the research was being conducted. However, while the researcher did have direct involvement in establishing the environment in which the study took place, he had no involvement with the students outside of those interactions mentioned in this chapter. He did not provide instruction to the faculty during the semester and did not take any action

to adjust the conditions of the course after the semester had started. He remained a non-participant observer despite his professional role in the system. This disclaimer is important in order to clarify the researcher's role in this study and to mitigate any concerns about bias and fidelity that may emerge from this role.

### **Timeline**

Work on revising the Research Design course began in May 2017. Having defined a set of learning objectives for the course, this researcher—acting as a participant instructional designer—worked with a faculty member (Hellen—a pseudonym—who was also the instructor of section S01) to create an objective map of the course. This map included all learning objectives, content- and context-related sub-objectives, course assessments, and assessment criteria (which were mapped back to the sub-objectives for validation).

Beginning in June 2017, the faculty member and researcher began creating the online course site, building all of the activities the students would see in the learning management system. Defining a social strategy—including both the rationale and activity structure—was an important part of this process. A discussion of this process will be included in Chapter IV. Course development was completed on July 21, 2017. At this time, the other faculty (for sections S02 and S03) were introduced to the course site and instructor guide.

Students began the semester taking this course in September 2017. Data collection took place in October and November 2017, with second interviews conducted in early December 2017.

## Chapter IV

### CONTEXT

#### **Introduction**

Activity systems analysis is a situated research methodology. The context in which the research takes place is therefore important to this study. In the conceptual framework introduced in Chapter II, the context is represented by a designed, intentional activity system with which students interact using self-directed and self-regulated behaviors. This chapter describes this designed system. Prior to exploring this system, this chapter seeks to further contextualize this study with information about the school, academic program, and course in which the research takes place. Each layer of this setting is described below.

#### **About the School**

This study takes place at a school of professional studies and continuing education at a comprehensive research university in the northeastern United States. The school is one of the newest at its University, officially approved as a school by the University's board of trustees early in the 21<sup>st</sup> century. As of the Spring 2018 semester, the school enrolls students in 14 degree programs, aimed at a diverse set of professional audiences. Many of these programs leverage distance learning or technology-enhanced learning as part of their delivery strategy.

### **Online Learning at the University**

The University's prior efforts to launch an online learning initiative are important to the story of the school's approach to online education. Before the school was founded, the University launched an online learning project designed to stave off concerns that new internet startups would make education cheap and accessible, eating away at the value proposition of a university degree. By partnering with other academic and cultural centers, the University believed they could be the first to market with a model for profiting from distance education. But in short time, the University had lost its investment and was forced to abandon the project.

### **Online Learning at the School**

This context is important because it was still recent history when the newly established school of professional studies and continuing education began considering online learning. The administration was aware that it needed to move slowly and have close control over how the courses were designed and taught. Early pilots were given a great deal of attention. The online course development team sat in on live class webinar sessions, planned and built highly structured course sites with rich narratives and compelling graphics, and paid special attention to building constructive knowledge networks for the school's population of working professionals. The last of these was particularly important and something the team felt differentiated the school from others in the online learning space. It also conformed with enrollment data that suggested one of the key reasons that students elected to come to the school was to join a student population of similarly driven individuals. Especially for programs that targeted a more senior audience, the school wanted to provide students a chance to share their experiences

with their peers, to learn from each other, and to establish professional networks that would extend beyond the classroom.

**The design process.** As online programs have expanded in size and complexity, school and program leadership have become aware of the need for consistency across sections. If the student experience were to be inconsistent across sections, students in some sections may be at risk of failing to meet programmatic objectives at the completion of the degree. Further, because students need to complete group work and class discussions, significant variance in ability across sections in one course may have a significant impact on social and individual activities in another class. Students must therefore be able to demonstrate the same course-level and concept-level outcomes.

The school's curriculum and instruction team partners with academic programs in the development of courses. The team assigned to work with a given program includes an instructional designer, a media production specialist, an educational technologist, and a webinar specialist to support the strategy for synchronous class sessions. For each course, the program's academic director identifies a single faculty member to partner with the curriculum and instruction team in developing the class. The academic director provides course-level outcomes that had been previously mapped to program-level outcomes during the program's design phase; design faculty are able to alter these course-level outcomes but only in consultation with the academic director and only after identifying any implications for changes to program-level outcome maps.

The designing faculty then defines assignments that can be leveraged to assess the learning objectives for the course. They also work to craft sub-objectives—the content- or context-specific learning goals that comprise a course-level goal. These sub-objectives

are simultaneously treated as assessment criteria on which assignment evaluation is based. For example, a course on organizational behavior may contain an objective that students will be able to diagnose an organization's health by analyzing its leadership, structure, and culture. Embedded sub-objectives include a student's ability to (1) analyze an organization's leadership, (2) analyze its structure, (3) analyze its culture, and (4) evaluate these analyses and provide a judgment about the organization's health. If students complete a paper in which they research and analyze an organization, the four items above could also effectively serve as criteria on which an assessment of the paper is based. These assessments can then be analyzed across sections to evaluate the consistency with which students are able to achieve these discrete concept-specific learning goals.

Finally, a set of instructional and assessment activities is developed for each of the sub-objectives. Activities in this model include such items as readings, resources, lecture slides, discussion activities, instructor notes, and facilitation guides. The course materials are all stored in a site on the Canvas learning management system. The synchronous class sessions for online courses are held via webinar using Adobe Connect; materials and recordings from these sessions are likewise stored in Canvas.

The primary goal of this project has been to ensure quality and consistency across sections of a course.

**Online courses.** While the school's offerings have changed in many ways since its early years, there is still an effort to retain elements from the early projects. Instructional designers continue to partner with faculty on the development of their courses, working together to uncover the storylines of the course and building dynamic

course sites that rely on that narrative structure for navigation. A typical week in a course begins with an overview page. The overview includes a narrative description of the week's key concepts, with a focus put on how the concepts are related to what happened in the preceding week and how they fit into the overall architecture of the course. Each activity is placed on its own page in the course, and each page contains a brief paragraph that situates the learner. The idea is that wherever the student enters to, they should be able to identify how the activity they are completing helps them to understand the whole of the course.

A corollary to this is the instructional designers remain heavily invested in the course and activity design. After building design plans for a course, designers create templates, then use completed templates to build the course site in the LMS. Sometimes, they will even draft activities or rubrics for faculty to give them a jump start on development of course pages. One of the early team leaders described the position as “chief cook and bottle washer.” This remains an apt description of the role.

Finally, the school has continued to emphasize the importance of collaboration and network construction as a cornerstone of course development professional studies. Because so many of the school's students have rich professional experience, designers try to find ways to build activities that encourage students to share these experiences and learn from one another. For this reason, the school's online courses continue to hold synchronous web conference sessions. There is also a strong focus on the development of asynchronous activities, such as online discussion forums.



## **Degree Program**

This study takes place in a degree program in analytics management. The program is designed for current and future analytics leaders. It is not intended to be a data sciences program or a hard quantitative program; it instead combines quantitative skill with management and leadership courses to provide students the skills they need to lead analytics teams and to provide value to the organization.

To address the program's learning objectives, it has been designed to have two core areas of a study described in Table 4.1: a technical core and a leadership core. The technical core introduces the analytics and data management capabilities that students will need, while the leadership core presents the capabilities needed for building an analytics culture and for defining an enterprise-wide perspective for analytics management.

In addition to the courses identified in Table 4.1, students complete two electives and an experiential capstone.

In the first semester, the Analytics in the Organizational Context course provides an overview of how different types of organizations are leveraging analytics for competitive advantage. The Analytics Tools and Methods course provides a basic primer on the tools needed for analytics-based decision making. The course is taught using the R programming language and teaches basic proficiencies that are expanded upon in later semesters and in elective coursework. In many ways, the Research Design course can be seen as a bridge between these two courses: students learn to address organizational and management problems by reframing them as researchable questions, then build out a proposal for how they would use analytical methods to answer the questions.

Table 4.1

*Program Curriculum (Fall 2017; Some Course Names Changed)*

<b>Technical Core</b>	<b>Leadership Core</b>
Analytics Tools and Methods	Analytics in the Organizational Context
Research Design	Change Management
Database Design	Communication
Data Visualization	Management and Leadership

### Course

When the program first launched, there was a feeling that the Research Design course was too focused on advanced statistical techniques, and that not enough emphasis was placed on the role that the scientific method could play when applied to addressing real-world business problems. The program's academic leadership decided to redesign the course to bring it more into alignment with this need.

Hellen had been an instructor in the Research Design course in its initial incarnation. She was popular with students and had significant prior experience as an instructor in both online and face-to-face formats. The program hired her to redevelop the class. As stated in Chapt 3, this researcher served as the instructional designer for the course, working with Hellen during the Summer 2017 semester on the redesign.

In the new Research Design course, students develop the ability to:

- Ask empirical research questions in terms of verifiable relationships between measurable variables.

- Transform research questions into methods of collecting and analyzing data on those variables.
- Assess the hypotheses of research proposals and the claims of research results.
- Communicate about research with organizational stakeholders.

Table 4.2

*Topics in Research Design*

<b>Week</b>	<b>Topic</b>	<b>Week</b>	<b>Topic</b>
1	Introduction to research design	8	Sampling
2	Elements of the research process	9	Hypothesis testing and statistical analysis
3	From business problem to research question	10	Randomized design and factorial structures
4	Qualitative and observational studies	11	Examples
5	Surveys	12	Formal proposals
6	Experimental design I: definitions and concepts	13	Presenting research findings
7	Experimental design II: validity and limitations		

Hellen developed a new set of topics (listed in Table 4.2) that were less technical and addressed the revised learning objectives for the course. Each week of the course covered one of these topics. A weekly generally began with readings, usually from a core text on business research or examples of scientific writing. Students then engaged in a discussion activity. The prompt often included a case study; students analyzed the study from the perspective of the research principle they read about for the week. Students then attended a live class session via web conference (Adobe Connect). Each session was 90 minutes long and included lecture and small group discussion. Though Hellen created a template set of slides for each class, other instructors were allowed to alter the lecture to include examples and exercises based on their own professional and academic

experience. After the session, students returned to the discussion forum, where they were asked to respond to one another and advance the conversation by bringing in their own professional context. At the end of the week, they often had an individual assignment that tested their understanding of the week's concepts. These assignments were either a short writing prompt or a multiple choice quiz, depending on the week. At the end of the class, students submitted a formal research proposal based on a problem they identified at the beginning of the semester. During weeks three and eight, they submitted drafts of their work for the instructor to assess progress. For this reason, weeks three and eight were specifically included for observation in this study. The third week observed in the study, week 11, was included because it was the final week in which the case approach is used for discussion. In week 12, students worked in pairs to review their final paper. In week 13, they presented an elevator pitch of their final proposal.

### **Discussion Activities**

The activity system in this research is discussion activities in the third, eighth, and eleventh week of the Research Design course. To develop the generic activity system map of the designed activities, all three instructors who taught online sections of Research Design were interviewed. Their pseudonyms and sections are Hellen (Section S01, who also designed the course), Patton (Section S02), and Mel (Section S03). There was some variance across the three instructors' perceptions of the goals of the discussion activities, as well as some variance in how goals were perceived across the three activities. In the section below, both a generic model for the activity system and variance by instructor and topic are presented.

## Activity Design

The instructors identified seven unique objectives for student participation in the discussion activities of the course. The seven objectives are defined in Table 4.3. All three of the instructors agreed that the discussion should be an opportunity to reinforce student understanding of research practices. They also agreed that discussions provided an opportunity for students to apply research concepts in a professional context. Each of the instructors identified one or two additional objectives.

Table 4.3

### *Objectives by Instructor*

<b>Objective</b>	<b>Definition</b>	<b>Hellen</b>	<b>Patton</b>	<b>Mel</b>
Understanding research	Understanding basic principles and terminology related to research design	X	X	X
Professional application	Student ability to describe use of research in a professional context (preferably their own)	X	X	X
Business process	Recognition of research as a core business process; more process oriented than research application			X
Complex design	Demonstrate ability to apply concepts to address more nuanced, complex questions	X		
Making decisions	Leverage research to make decisions for the organization		X	
Research as communication	Share insights and gain buy-in using research as a communication tool	X		
Way of thinking	Generalized approach to research as a party of daily life; intuition		X	

These anticipated outcomes may be different because of the background of each instructor. For example, Mel holds an MBA and has worked in marketing research for more than 30 years. This was his first semester teaching Research Design, although he has taught the Analytics in the Organizational Context since 2016. He was the only

instructor to identify *the role of research as a business process* as an objective of the course.

The discussions were designed for the Canvas learning management system (Canvas), which is used for all asynchronous activities in SPS online courses. The tool allows for instructors to author a prompt. Students click a reply button to launch a rich text editor in which they can author a response. While the instructors felt the tool was functional in this regard, they also believed it offered little else with regard to flexibility. Patton described the tool as “straightforward:” students review the prompt then use the textbox to enter a response. Mel described it as follows: “It’s fine for what it is. It’s a discussion tool.”

During their interviews, all three instructors spoke of the role of the community in the discussion activity. Hellen described the primary purpose of the discussion as an opportunity for students to “get them to think about the particular topic they're going to be covering in class, and then after the class, once they had exposure to it, kind of to solidify it and get them to think about it again.” This goal is more aligned with the objective of *understanding research* described above. Hellen added that it is her hope the discussion serves as a space for adding and exchanging new ideas. Patton was more firm in his desire for this additive exchange, a feature he referred to as *value*.

You can give them prompts and they can react to the prompts. If you’re in a group or even in a diad with one other person, if they introduce elements that you aren’t aware of, that changes the physics of the game, it changes the nature of the game. Then it’s up to the original folks to go back and say, “All right, does the law and the things that we said still hold? Are there other elements that we have to consider?” There is a building process if done correctly.

Mel suggested that this benefit of learning from others often extends to professional networking and outside of the class context.

Some students bonded with each other, and I think some of them because they knew each other from other classes, but they tried to bring other people into their “community.” They would share their papers with them, their proposals. They’d get together offline to talk about it, which is good.

The instructors also described the role that comfort plays in the establishment of a community. Patton pointed to evidence from an activity late in the semester in which students were meant to share their final proposals with a partner. The assignments were going to be distributed randomly, but students asked to stay in the discussion groups they had been in throughout the semester. “They had really good synergy with their discussion groups and they wanted to review folks within their group.” Mel pointed out the importance of this factor especially as it relates to heavily Chinese population in his class. He described that he had talked to many students who “are afraid to type because they might not be understood.” This presents both a challenge to and an important feature of the community: students have a small group with which they can develop comfort to mitigate the fear of speaking. The question of comfort did not come up in conversation with Hellen. This is probably due to the fact that Hellen’s class was comprised only of advanced professional students (more than five years of professional experience); this class did not have the large international population that was present in the other two sections.

As a last feature of community, Mel suggested that some students needed to be pressured to contribute. He told the story of a student who would reach out and complain that other students in his group were not participating. This promoted Mel to send an email to the other students saying they “need to step it up a bit.” Only Mel identified this during our interview. This also explains why only Mel opted to change the groups midway through the semester:

Some of the issues with this class is the experience is so vast. There's probably five or six students that really have experience to share. Some of the other students really are not engaging, online or even in the classroom, so it's hard. I took so many suggestions early on, and I changed some of the groups to be those with experience put them in a group together, and it helped a little bit as we went through the process.

All three instructors established rules in the class about posting. The actual prompt instructed students to reply to the original post prior to class and then to return after to continue the discussion. The language was left intentionally vague. In developing the course, there was concern that being restrictive would make students behave in ways that were more mercenary; leaving the wording vague was intended to make students feel that they were responsible for establishing a community and for their "contributions to the class discourse" as is described in the assignment rubric. Early in the semester, however, the instructors felt that the vague description was confusing to both them and their students and they provided more concrete rules: all students need to post once prior to class and then at least two more times following class. These rules were further explicated in the grading of the student participation. Hellen—who did not explicitly tie *value* to student learning—suggested that the only objective mechanism for grading is "whether they posted something or not...that's the only rule that I can see as whole: participation." Mel and Patton, however, viewed value as being the primary grading criteria, even at the expense of quantity. As Mel described "if somebody just put one response to one student, but it was lengthy, that was fine. If it was just saying 'hey, great job,' that wasn't, you know?"

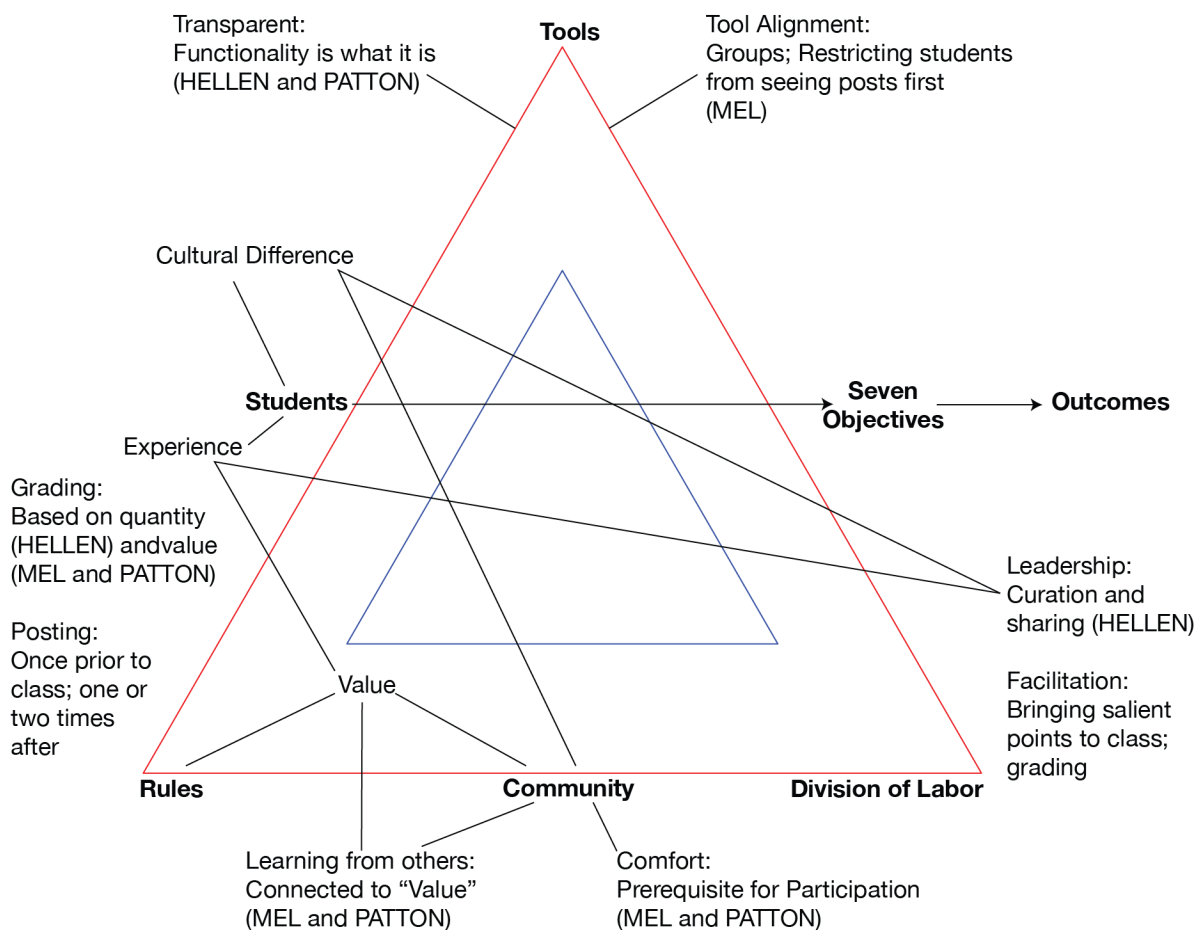
A final consideration for the generic activity map is division of labor. While the instructors all described students as occupying similar roles, they did all express a desire to have students take on specific leadership behaviors. For Mel and Patton, such



leadership would likely be tied to expertise. Because their classes were mixed with respect to experience, Patton suggested a leader might emerge, “That’s a function of personality. It’s a function of feeling proficiency with the material, and I think it might be a function of how much experience you’ve had.” Mel offered that the expert role would be exhibited by more frequent contributions to the forum. “I wouldn’t call it being leadership, but being more outspoken. Whether their comments are good or bad is immaterial, but they are more engaging.” Although she did not have the same expertise gap, Hellen also considered roles, such as team leaders. Although she did not expect the role to emerge organically, she felt such a role might be assigned, with responsibility for curation and sharing of key findings from the discussion forum.

In addition to the student roles present in the forum, another important role in the forums was that of instructor or facilitator. None of the instructors was an active contributor to the discussion, but all three read the forums prior to class and brought key examples and insights into the class discussion. In this way, their role became reinforcement of participation and curator of the discussion’s content. Teaching assistants did most of the grading of the forums across all three sections. In the interviews, all three instructors identified providing relevance as another important function of the instructor role. Given the diverse student experiences present in each group, the instructors felt they needed to supplement lectures with examples that both demonstrated their own expertise and were relevant to their students’ own interests in the analytics field.

Taken together, a generic representation of the activity system map is illustrated in Figure 4.1 below.



*Figure 4.1:* Generic instructor-defined activity system map for discussion

To reiterate a disclaimer presented in the opening of this chapter, the researcher made no qualitative assessment or judgments of how the individual instructors vary their interpretation across the three sections, nor did he attempt to interfere or influence the instructors during the course of the semester. Instead, the differences are simply noted in Table 4.4 as an expression of both the diverse student population present across the three sections as well as differences in the backgrounds of the three instructors. With respect to the student population, the instructors identified differences in experience level and culture that could influence both the division of labor and the community construction. However, the diversity of population impacted Mel and Patton significantly more than

Hellen, who was teaching the advanced cohort of students. Similarly, Hellen, who created the template slide decks, has a Sc.D., and has spent years as a medical researcher before becoming an independent research consultant last year. Mel, with his own background in marketing research, felt the examples that Hellen included did not resonate with him or with his students and opted to change them to examples from his own experience.

Table 4.4

*Thematic Elements Referenced by Instructor*

<b>Element</b>	<b>Definition</b>	<b>Hellen</b>	<b>Patton</b>	<b>Mel</b>
Transparency	Belief that the tool functions are fixed and cannot be changed to influence learning.	X	X	
Tool alignment	Attempts to alter tool settings to improve community and student goal attainment.			X
Value	Advancing the notion that contributions should be additive to community learning by tying them to grading or role creation.		X	X
Comfort	Identifying the importance of student comfort for sharing and communicating.		X	X
Posting rules	Development of rules to quantify expected contributions.	X	X	X
Leadership	Curation and sharing.	X		

**Weekly Discussion Prompts**

A final factor influencing the expression of each activity system map is the actual discussion prompt. This is important because instructors had different goals for activities relative to the particular prompt and the week in which it was being presented.

In the third week of the class, students learned about converting business problems to research questions. The content was based on a “research hierarchy” presented in the student’s textbook. The week’s activities were designed to help students discuss examples of framing in a research context, develop research questions, and use secondary data to refine their questions. The case study presented in this module was adapted from the course textbook’s resource center. The case revolved around a country club that is having trouble attracting new members. The country club complete a member survey to learn more about what attracts people to the country club. Students reviewed the case details and the survey and determined whether the research questions emerging from the business problem were aligned with those driving the survey design. After their class session, they returned to the discussion, working collaboratively to determine whether the survey should be framed differently. A final question asked them to consider how their own experience helps them to complete the assignment or how the experience of participating in the discussion helped them to frame their own research questions for their final course assignment.

**Week 3 discussion prompt.** All three instructors said that improved understanding of basic research principles was an objective of the discussion in week 3. They also felt that the professional application to the context of the country club was important (per Hellen: “they were asking questions that didn’t match their goals, and that was one of the things that we wanted [students] to recognize”). Because the activity appeared early in the class, they expressed that students were not yet far enough along in framing their own research questions to have anything from their own context to contribute to the discussion. As shown in Table 4.5 the lone deviation from this objective

set is Patton, who also believed students should have been working to build their capacity to think as researchers and to leverage a research mindset for creativity.

They're identifying the extent to which they think this approach is effective and if not ... I think since pretty much picked up on that the approach wasn't a panacea, that there is places where it can be improved, what are those places. That's where they start feeling in within this scaffolded structure, they start putting in the bricks and the motor and figuring out where can we improve, what can we do, what can we do better with this one. It's like taking what the situation was and then building on it, modifying it.

Table 4.5

*Objectives by Instructor (Week 3)*

<b>Objective</b>	<b>Definition</b>	<b>Hellen</b>	<b>Patton</b>	<b>Mel</b>
Understanding research	Understanding basic principles and terminology related to research design	X	X	X
Professional application	Student ability to describe use of research in a professional context (preferably their own)	X	X	X
Business process	Recognition of research as a core business process; more process oriented than research application			
Complex design	Demonstrate ability to apply concepts to address more nuanced, complex questions			
Making decisions	Leverage research to make decisions for the organization			
Research as communication	Share insights and gain buy-in using research as a communication tool			
Way of thinking	Generalized approach to research as a party of daily life; intuition		X	

**Week 8 discussion prompt.** By the eighth week of the course, students had considered different types of research design and were beginning to look at the mechanics of putting together research. This week of the course focused on sampling. As with all units of the class, there was a focus on how the topic aligned with the research

hierarchy; students were not just exploring sampling, they were exploring sampling in the context of the research questions they were trying to answer. The topic for the week was a fairly contemporary case. In the weeks leading to the 2016 presidential election, nearly all national polls had Hillary Clinton with a sizeable lead over Donald Trump. But on election day, Trump pulled off a surprise victory. The question was: how were the polls so wrong? Students had to review election post mortems from 538.com, The Atlantic, and Huffington Post. They were then asked to consider what sort of sampling schema was used and why it was incorrect.

Table 4.6

*Objectives by Instructor (Week 8)*

<b>Objective</b>	<b>Definition</b>	<b>Hellen</b>	<b>Patton</b>	<b>Mel</b>
Understanding research	Understanding basic principles and terminology related to research design	X	X	X
Professional application	Student ability to describe use of research in a professional context (preferably their own)	X	X	X
Business process	Recognition of research as a core business process; more process oriented than research application			X
Complex design	Demonstrate ability to apply concepts to address more nuanced, complex questions			
Making decisions	Leverage research to make decisions for the organization			
Research as communication	Share insights and gain buy-in using research as a communication tool	X		
Way of thinking	Generalized approach to research as a party of daily life; intuition		X	

After the class, they returned to the discussion to talk about how they might do things differently. Again, they were asked to consider this in light of their own work: what lessons could students apply to their own organization, and what change

management techniques might they consider exercising to change organizational behavior related to sampling?

Deviation in instructor perception of goals is described in Table 4.6. By this point in the course, Hellen felt students should have the ability to apply their understanding of research to both the case and their own experience. Given the topic, she believed such connections should be simple:

They pretty much had to rephrase that in especially that next to last question. Kind of showing that they understood what the problems were, and then just say, ‘How would that apply to their own particular organization?’ Mel did not express this as an expectation for all students, though by this time in the semester he had already changed the group design, moving the experienced students into their own discussion group. Still, he said, “maybe four or five students actually can relate to that particular question, so we kind of left it alone.”

**Week 11 discussion prompt.** Finally, students began putting together a final research proposal. In week 11—instructor perception of objectives for which are described in Table 4.7—students examined examples of completed research to look at how all of the elements fit together.

The objectives of the week were for students to define how research elements studied in the class all fit together and to evaluate examples of completed research. Their discussion scenario asked them to imagine that they were members of an organization that is trying to be more innovative. In preparation for a senior leadership retreat, the CEO has been given two articles with competing perspectives. The director of human resources provides research saying that diversity is important to innovation; the director of information technology provides research noting that technology firms in Silicon

Valley are notorious for their lack of diversity, yet are among the most innovative companies on earth. Students were asked to consider that the CEO wanted them to evaluate the merits of the research and identify the types of questions that might arise about each. After the class session, students returned to the discussion to try to develop a compelling case for how they would address the CEO's questions based on the research. They were also asked to draw lessons from the situation that are applicable to their own research context.

Table 4.7

*Objectives by Instructor (Week 11)*

<b>Objective</b>	<b>Definition</b>	<b>Hellen</b>	<b>Patton</b>	<b>Mel</b>
Understanding research	Understanding basic principles and terminology related to research design	X	X	X
Professional application	Student ability to describe use of research in a professional context (preferably their own)	X	X	X
Business process	Recognition of research as a core business process; more process oriented than research application			X
Complex design	Demonstrate ability to apply concepts to address more nuanced, complex questions	X		
Making decisions	Leverage research to make decisions for the organization		X	
Research as communication	Share insights and gain buy-in using research as a communication tool	X		
Way of thinking	Generalized approach to research as a party of daily life; intuition		X	

This topic was particularly noteworthy for the various student interpretations of the discussion (described in greater detail in Chapter V). Four possible topics of discussions emerged: (1) the value of diversity, (2) the validity of the research, (3) the organization's



approach to the research, and (4) their own approach to using research to address complex questions. Hellen had high expectations that this activity would expose students to more complexity in the research design process. Further, she expected that their review of the more complex research would get them to think more about the complexity of their own questions and to refine their own proposals. Mel, meanwhile, believed that the focus of the activity was the organizational level. How well did the students understand the organizational context in which the research was being conducted and how did that inform their interpretation? Patton expressed trepidation about the topic. Diversity, he felt, was both important and frightening because it provided a degree of “political complexity” about which students may be afraid to speak:

In research design, if nothing else, we’re training students a way of thinking. That thought process, in theory, the scientific method is perfect, in theory. In actuality, there are so many complicating factors that it doesn’t end up working like that. If you approached a given situation with a preexisting bias, and you’re asked to reflect on that, I think you’re not using the faculties the same way you would be doing for a case that had no potential political overtones to it, is basically what I’m saying. That just scares me because I want them to think in this way no matter what, but you can get stunted a little depending in what the story is.

From a goal perspective, then, Patton wanted students to both leverage their way of thinking to overcome preexisting bias and to make decisions in an organizational context that were free of these bias.

## **Conclusions**

This chapter introduced the context in which the research took place. In so doing, a generic activity map was created explaining the perspective of the three faculty on how discussion—as an activity system—was leveraged toward learning goals in the course.

Specific information about the instructors' nuanced approaches to teaching the course were identified, as were activity-specific goals for each discussion. This information will be used in the following chapter to define unique designed systems with which students were assigned to interact. The manner in which students interacted with the system—the ways in which they perceive and engage within them—will be the subject of the remaining chapters of this study.

## Chapter V

### RESULTS

#### **Introduction**

As noted in Chapter III, this analysis is structured around the unique narratives provided by the individual cases presented below. For a reader to understanding the findings of this study, it is first important that they have a depth of understanding of the students' perceptions of the activity system in which they are operating. To that end, this chapter provides an overview of the study's data in the form of narrative descriptions of the individual cases.

This chapter is divided into two parts. First, there is an exploration of the collective and individual activity system maps. As described in Chapter III, each of the participant interviews was coded using descriptive codes. Descriptive codes are intended to “summarize in a word or short-phrase...the basic topic of a passage of qualitative data” (Saldaña, 2016, p. 102). This initial set of codes is described as first-cycle, and were kept intentionally open in order to create the most comprehensive possible set of descriptors. Second cycle coding procedures are more advanced methods for “reorganizing and reanalyzing data coded through first cycle methods” (2016, p. 234). In this research, first cycle codes were grouped around the structural components of a traditional activity systems analysis—a process known as axial coding—in order to develop a generic map presented at the opening of this chapter. All codes and definitions are listed in Appendix

E. The chapter also includes the unique narrative descriptions of the individual student cases. The second part of this chapter is a description of a model for exploring behavior and attitudes associated with self-direction. As described in Chapter III, this model is based on a second instance of axial coding involving the same first-cycle descriptive codes and a new set of structural codes aligned with both Garrison's model for SDL (1997) and the SDLI instrument that was used in this study (Cheng et al., 2010). This includes self-motivation, self-monitoring, management (planning and implementation), and management (communication).

### **Activity Systems Maps**

In first cycle coding, descriptive codes were attached to excerpts. As described in Chapter III, transcripts were coded and then recoded with new codes added in subsequent data. This coding and recoding continued until the codes reached saturation, or the point at which no new codes or code edits were necessary to describe a new interview. This was reached after five individuals (or ten interviews).

The final code list included 87 unique codes. Of all 87 codes, only one (instructor self-assessment) was not used by any student. It was therefore not included in the activity system map. To develop the map, each of the codes was reviewed for its best fit with the elements of activity systems analysis. Within these divisions, they were organized hierarchically or categorized as needed. For example, three of the codes dealing with time (not time limited, immediacy, and limited time) were all connected into a single category of time that lived under the category of rules. Some branching (familiarity or "new to me"; needs clarity or "not didactic") were also defined.

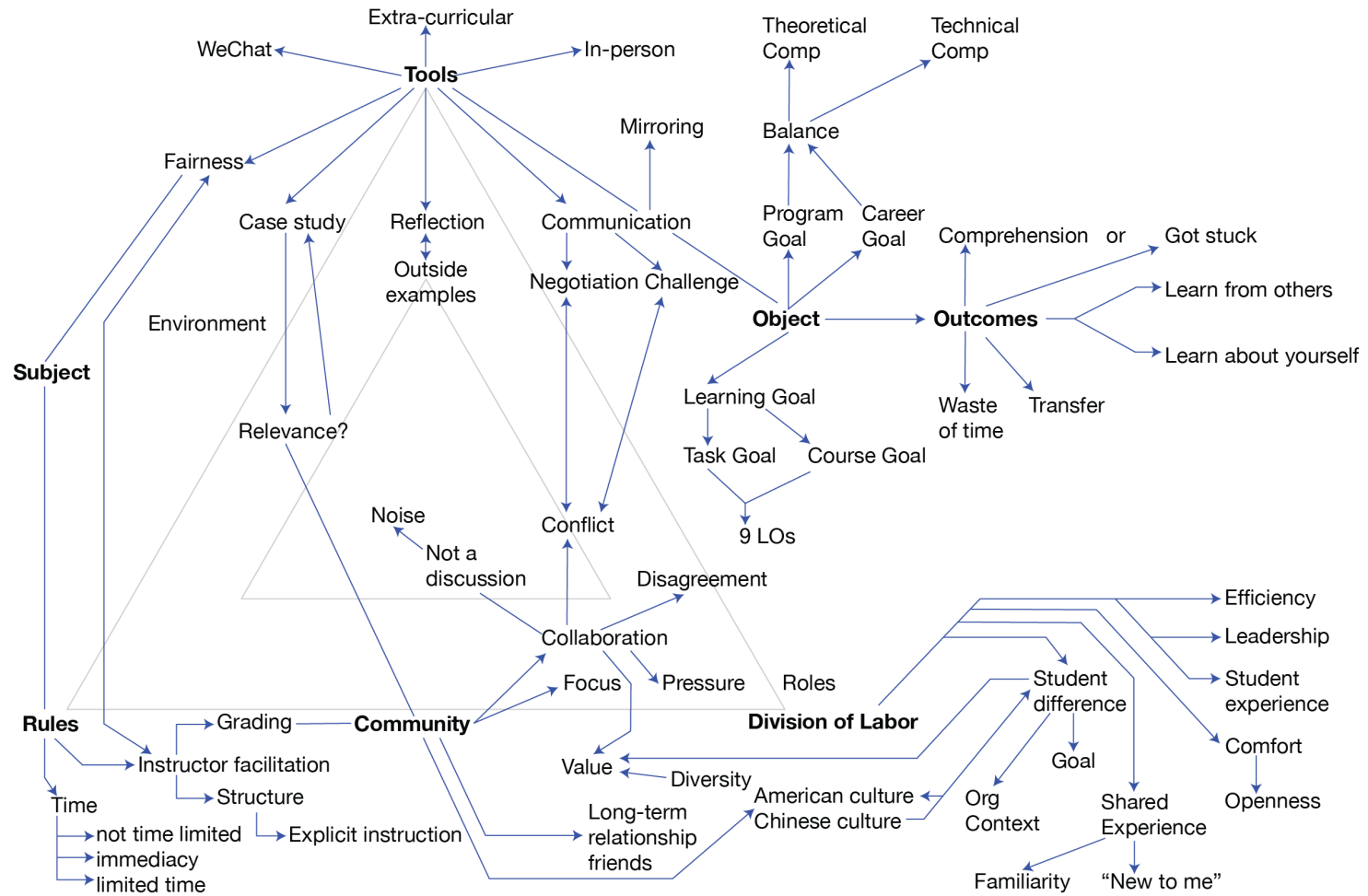


Figure 5.1: Comprehensive activity system map

Once these relationships were established, an activity system map was defined. The comprehensive map of this activity system is displayed in Figure 5.1. Individual students were found to take on certain elements or branching of this map depending on a) their own perceptions of the activity system and b) their instructor's specific attitudes and facilitation of the discussion. Each of these cases is described in detail below. Tensions within the map are explored in greater detail in the second half of this chapter.

### **Case 1: Wendell**

Wendell is a student in his mid 30s. He is in Hellen's D05 section of the course. Although he is an international student, he is among the small population of international students not from China. He has also been in the United States as a student and professional for more than 10 years. Wendell graduated with an undergraduate degree in business administration from a private college in New York. Following graduation, Wendell went to work for a national chain restaurant. There, he oversaw business development and the launch of an app-based delivery service that reduced costs and increased customer satisfaction. After five years, however, Wendell followed his other passion, leaving his work to pursue a career as a professional athlete. The move had erased Wendell's professional network when he retired as an athlete and returned to the professional world. "I pretty much lost those connections," he said. "It's like I'm starting from scratch."

Now, Wendell is looking to return to a career as a business analyst. He is agnostic to the type of organization he will go into, noting "for me, management is management; it doesn't matter the environment or the industry. I love dealing with people, managing people, working with them." He enrolled in the analytics program to bridge the gap

between the theoretical/management competencies he already possesses with the technical/analytical competency he hopes to develop. During the interview, Wendell referenced the need to develop technical competency ten times; he referenced theory-based practice only twice. Still, his stated learning goals highlight his desire to apply these technical skills in practice. He specifically referenced the learning goals of understanding research (14 times), professional application (13), research as a communication tool (2), and research as a business process (2). The latter is noteworthy because it is not referenced in Hellen's activity system model of the Research Design course discussion activities. It therefore represents a goal that has been introduced by this student into the activity system map shown in Figure 5.2.

Unfortunately, Wendell felt that the structure of the discussion activities—including their placement within the flow of a given week and the instructor facilitation—led to community pressures to stick close to the case and to treat them as objective problems that had single correct solutions. He said:

I think a lot of the students here ... I don't think they really understand how the real world works. I think they're too much into the books and I think the books give you a good ... The books give a foundation, but in the real world you can only use that foundation to a certain level, then you have to start thinking, you have to start connecting with people, network to get things done. There's no one way, there's no right way. It's a paradox, but then solving the problem remains consistent. So there's multiple ways, hundreds, thousands of ways to fix that problem. So you've got to find the right way to fix the problem for that particular time. I just think you cannot ... If the book tells you this is how it is, or these are the variety of ways you can use it, doesn't mean there isn't another one that exists.

Wendell said his openness to having multiple solutions helped him to make use of the community in his efforts to build comprehension of research skills. He said that both the individuals in his discussion group and his course teaching assistant helped to develop

technical competency. He shared an anecdote from week 3 in which he used a term in discussion incorrectly and was corrected by the TA. This led him to revisit the term.

Wendell suggested that the group's ability to face conflict and difference in their responses was personally productive. He felt that the communication skills used to negotiate a single solution were reflective of the types of skills he would need to sell large analytics projects in an organization.

I mean it shows that everyone has a different perspective. It shows that even though you might think you're right, it's good to just listen or just relate to other peoples' perspective to understand where they're coming from. Instead of being one dimensional you can see what things can get done. The [week 3 case] is a good example, talking to the TA, talking to the students, everyone had a different perspective, a different approach. I think it helps. Teaches you patience too.

Despite this assertion, observations of this week's discussion reveal that there were no responses to any student's initial post in Wendell's group. They also indicate that neither this corrective action from the TA nor any form of correction from Wendell occurred within the public forum; this suggests they must have been in private conversation around student grading, but it is unclear if the collaborative learning that Wendell described was actually a collaborative act or simply a reflective, personal act that was spurred by his participation in the discussion.

This may be caused by the same community pressure that forced students to seek single answers. Wendell described his class community as comprised of "all-stars," and said that pushed him to prepare and to be thorough in his discussion responses. He said that while the group encouraged each other to learn (about both course content and themselves), that explicitly seeking help and clarity is "more of our hidden agenda; certain help you don't want anybody to know." This was also the case with Wendell's reaction to introducing personal examples into the forum. Nobody would think to do such



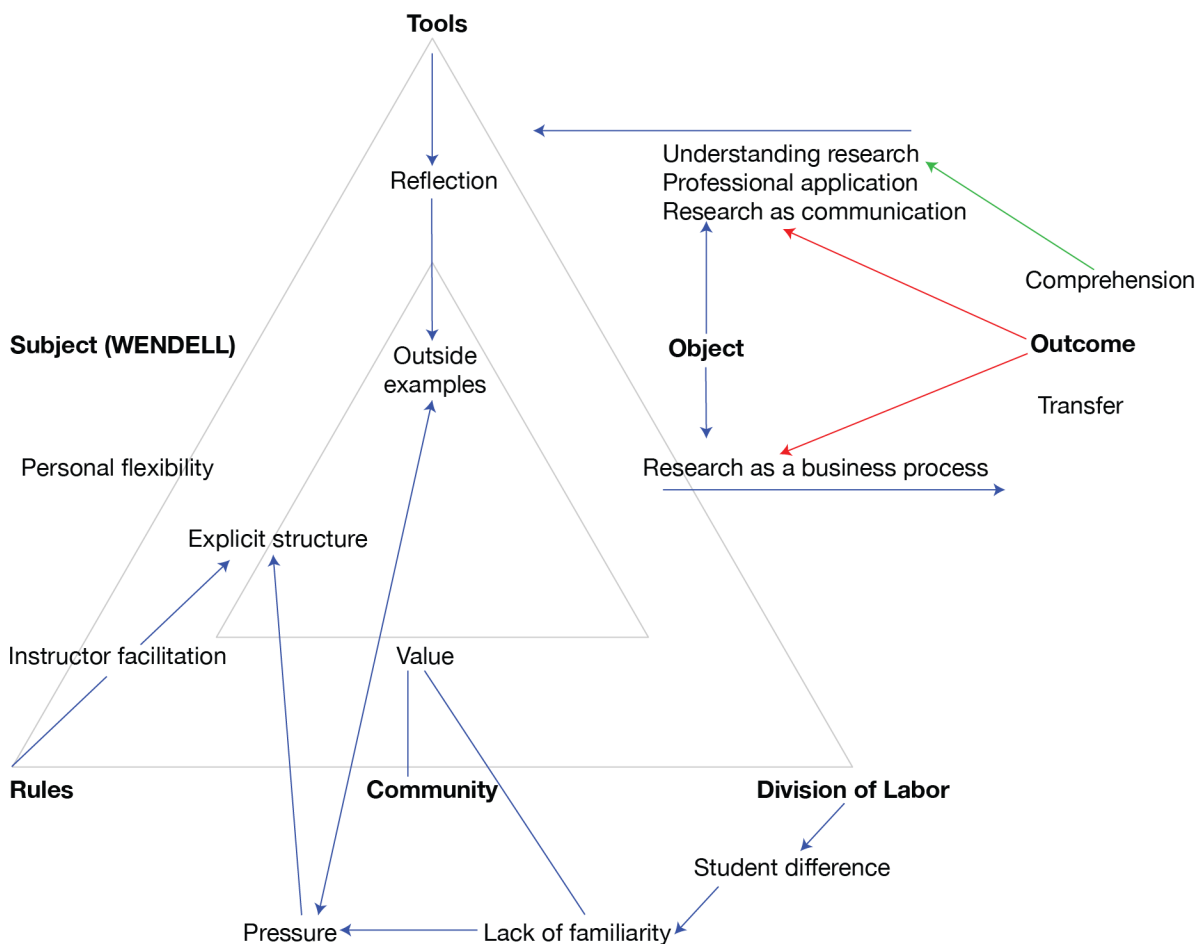
a thing, he said, despite the fact that it was an explicit instruction in the discussion prompt. “approach you take, the goal is to solve the [case] problem,” he said. If a student introduced their own case, the rest of the class would “challenge you, so you better be prepared to explain why and how, you know?”

This can be further exemplified by field notes from the discussion in week 11 of the class. After Wendell’s initial post about potential errors present in the case articles about diversity, another student responded and noted her agreement. She added that there were other factors that should be considered in the particular case, such as the geopolitical factors that might give some people more access to resources and education. Wendell agreed, noting his own background as an international student. In the forum he wrote:

I was going to address the point of another independent variable as cultural and geographical norms that could influence the industry that people go into. For example, [my home country] is known for agriculture and industrial engineering and most people tend to fall into those career paths.

This example—in which he responded with a personal anecdote about a topic with which he is uniquely and intimately familiar—is the only such case identified in the observations of Wendell.

The only goal mentioned by Wendell that was not part of Hellen’s initial map was the role of research as a core business process. However, Wendell’s two mentions of this co-occurred with his description of research as a communication tool, indicating that he saw these two objectives as linked. Most frequent co-occurrence for Wendell were combinations of the terms tension, familiarity, community, and comprehension. This may be due to Wendell’s assertion that familiarity and comprehension are pre-requisites—and not anticipated outcomes—of collaborative discussion.



*Figure 5.2: Activity system map for Wendell*

### **Case 2: Starla**

Starla is a 22-year old student from China. She received her undergraduate degree in Finance from a university in Taiwan. Her prior work experience—three short-term, full-time internships—totaled just over three months of work. All of the prior experiences were in the financial sector. Ultimately, Starla hopes to become a business analyst, and she believes the analytics program can help her towards that goal. Finance, she said, “is a little bit theoretical.” She believes statistical thinking can help her round out her education, but she does not have aspirations of being a technician, and believes that this

program therefore provides the appropriate flexibility and focus. Her motivations for the Research Design course are similarly career-driven. Though she began the course not knowing what it would enable her to do, she found that as she was looking at job descriptions, research design was a skill frequently mentioned by potential employers. Also, she noted, simply reading the completed research reports that were required reading in this and other courses provided additional motivation: at first she thought she could never complete such a report, but having taken the course, she believes that one day she could. Figure 5.3 shows the full activity system map for Starla.

Asked about what she saw as the value of discussions towards her ability to meet these goals, Starla asked for clarification: “does it have to be something from the knowledge, from this course?” This is because Starla saw the most value in the networking and communication with her classmates. Outside of professional networking, however, Starla was interested in using the forums to identify other participants with whom she would like to form a friendship.

Through this process, you can know what kind of person [would] potentially be your friends later, because for example, when we were doing the discussion some people are heatedly discussing about the topic the teacher proposed, while some just keep silent and they are not willing to talk...For me, I’m willing to talk to those who are willing to talk instead of those willing to type because I think communication and making your own voice is the first step of making good friends.

Starla felt that given her professional goals, these communication benefits were more important than content from the course. If she had aspirations of being a data analyst or a data scientist, she said, this course would be helpful. “But for a business analyst, I think it’s more about communications. It’s not about the work, that you can do research...That’s my opinion.” Starla said the program itself provided many

opportunities for her to communicate and form these relationships. She said that extra-curricular activities have helped her to build these relationships.

Starla pointed to the Analytics in the Organizational Context course as a space where students were explicitly asked to share their personal experiences. In the third week of that course, for example, students were asked to share examples of how they use mathematics and analytics at work. As a result of the question, she said, she was able to learn more about the context of other individuals in the course. In the Research Design discussions, however, the question was more focused on a specific case.

[The week three discussion] is about to list of the research, the structure of it, so we don't have much space for our own experience, nor did the teacher ask us to share because we are supposed to focus on solving the problem he proposed, related to the books knowledge, so I think the [discussion] board does help but it depends on the questions and the courses.

She said that although the instructor did ask for students to share personal experiences in the instructions for the discussion, she did not think it was necessary to do so in order to gain full credit for the class discussion. She did not think that students were being purposefully negligent of the obligations, but said that the behavior was reflective of the fact that there was little space across the discussion for sharing personal experience. For her own process, however, she said she did follow the instructions, returning to the discussion to review the instructor's instructions and respond to the other students. One thing that Starla did that most other students did not was respond to her own post with updated thoughts and reactions after the live session; she did this in each of the three weeks observed.

She said she engaged in this behavior because it was how she interpreted the instructor's expectations. At a certain point, however, she found that she was struggling

to understand how each of the elements were leading to clear takeaways from the course. “I found I got stuck by the course” she said, “because there were too many, too much knowledge that flowed to me that I cannot grasp them and digest them all.” She said she grew to the point where she felt all she could do was complete the assignments without worrying about what she was learning. Around the middle of the term, she went to her instructor (Mel) and said she was unsure how to continue with her studies; with no exams, she was not sure how to tell where she was relative to where she was supposed to be—and that she was not sure where that was in the first place. Mel supplied her with additional readings that provided a clear structure of where she was headed for the class, which she said helped her appreciate the course for the remainder of the semester. “That’s the most important question, because sometimes we are just focusing on the details and we’ve lost the main principle.” By the end of the course, however, Starla was still expressing confusion about how each week fit into the structure of the course. She described the course as having two separate directions: one that is your final goal in the course and the other that helps you achieve that goal. This, she described, was “bewildering.” She did say that as she wrote her final proposal, she saw how all of the pieces fit together. However, she noted, “writing is one thing, and reading is another thing.”

For the discussion in week 8, Starla was able to understand that the main focus of the discussion was sampling error. However, she said that she found the topic of the presidential election fascinating and wanted to discuss more. She said the discussion reminded her of experiences she had had traveling the country when she first moved to the United States, learning about how different life was in the rural south from what it

looked like in the urban northeast. Still, she said, “if the discussion is [about] sampling error terms, I think there’s not much to say about it.” She wondered if there was room to extend the discussion to talk about these other topics of cultural significance.

Starla said that much of the work of extending the discussion took place in WeChat, where Chinese students would meet to speak about the class experience after live class sessions. She said most of the chatter was not related to the specific content, but that people would use WeChat to talk about their class experience. In one example, Starla said another student suggested that she stop participating in class discussion and move to WeChat instead; Starla felt to do so would have been a waste of “time and concentration.” Still WeChat allowed her a space to converse, especially because in-class discussion sessions were often cut short by the instructor before her group had completed their discussion.

In week 11, Starla said she was not sure what the instructor’s objectives were for the discussion. As a result, she focused more on what she was supposed to be reading than what the intention of the activity was. As she did in the two other discussions reviewed, Starla responded to her own discussion immediately after the live session. However, instead of revisiting the content, she made the following observation:

I want to say, every time the requirement for discussion states the words should be between 100-200, but sometimes it is too little while most of the time is adequate. Can it be made customizedly?

Starla admitted she had asked Mel prior to making this post, to make sure that her understanding of the instructions were correct. Mel said that he would prefer the discussions to be short, so Starla posted this to the discussion. She said her post was not intended to push people to follow the directions, but said she felt better after posting it.

“If you have something on you, you can talk to your friends after you say it out, it's much better for you.”

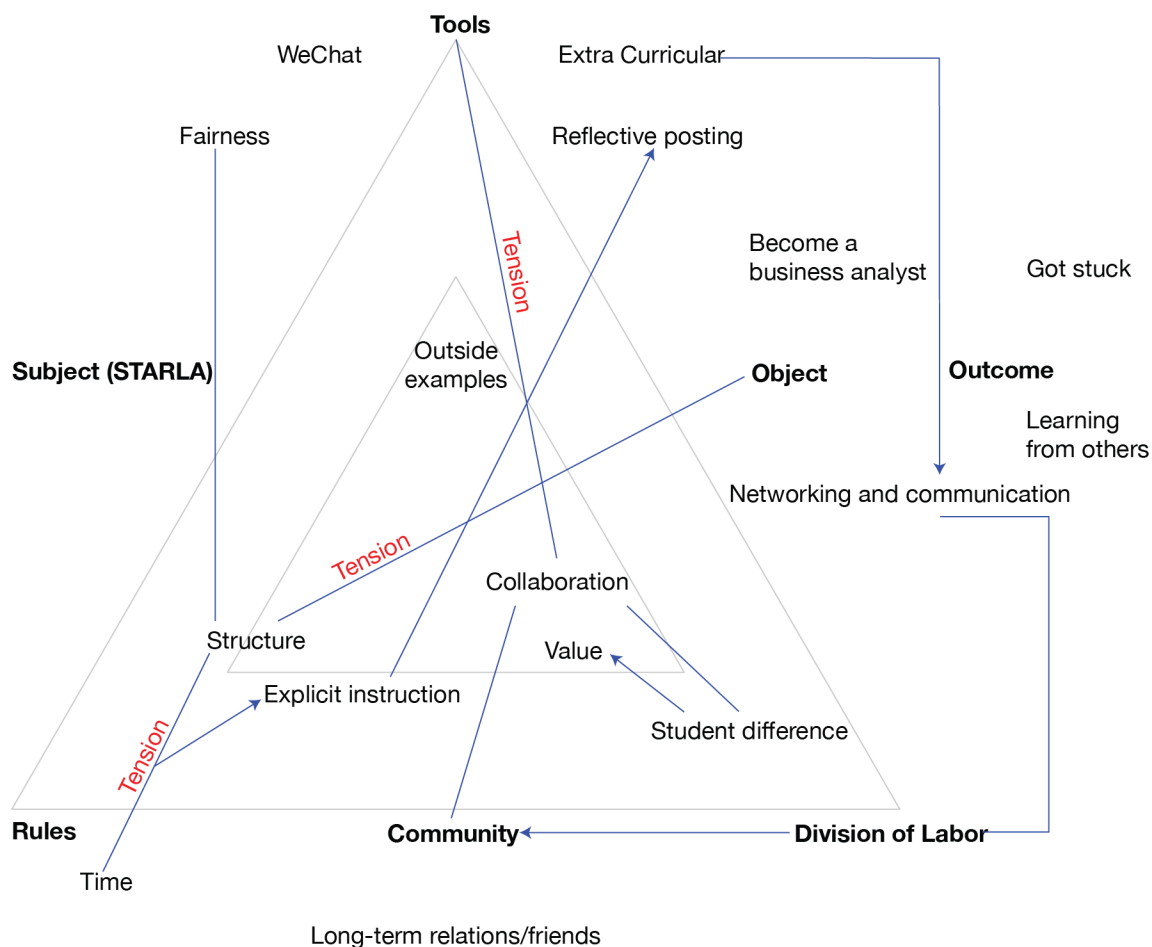


Figure 5.3: Activity system map for Starla

Uniquely, Starla did not explicitly identify learning goals. Instead her goals centered on career placement and communication and networking. Still, task goal/tension were co-occurring codes on 13 instances within the interview. Tension related to tools was the second most identified co-occurrence; this may be due to Starla’s unique goals and the sense that a tool like WeChat would be better for building community than one like the discussion forums, due to immediacy (tool and immediacy co-occurred six times) and network size and composition (tool and friends also co-occurred six times).

Community/tool (eight) and community/tension (seven) were also frequently seen together; the combination of these three codes co-occurred on five different occasions.

### **Case 3: Merrill**

Merrill is a 22-year old student from China. Her undergraduate degree—from a Chinese university—is in psychology. Merrill is hoping to make a career pivot into management consulting. She believes that earning an advanced degree will make her more competitive in the job market. She was attracted to the balance that the program provides in its curriculum, noting that the leadership core act almost “like an MBA course to provide us with some business knowledge,” while the technical core and electives provide skills that will make her a more attractive candidate to employers. Though she thought that she may “have to design some research, maybe” in a career aimed at problem solving, the real benefit of the research design course—in her opinion—is that it cultivates a level of critical thinking that is crucial for her future work.

Merrill’s psychology background meant that entering the course, she already had some familiarity with basic principles associated with research, but she said the experience of participating in the discussion helped her to think about the application of these concepts in a professional context. Merrill took this one step further, suggesting that the case-driven discussions enabled her to grapple with the complex organizational factors that made simple research problems much more complicated.

I think when I see those case studies in Research Design course it’s also like we have to consider more complicated influence, factors that may influence the results, like organizational inertia. There are people are resistant to change, and also sometimes in the past I conduct the research only because it has theoretical impact, but now we are really deal with the real problem in the business.



This suggestion meant that Merrill's goals for the activity included understanding complex design problems and developing a way of thinking, neither of which were presented by her instructor (Mel) as goals during the interview process. Merrill also noted that the discussions are useful for helping to practice and demonstrate proficiency with written English. These goals are represented in activity map that appears in Figure 5.4 below.

Merrill said she benefited from student difference in the discussion forums. She said that she considers herself to be an open-minded person and that when other students would bring their unique perspectives to the discussion, she benefited from understanding a perspective that differed from hers. For that reason, Merrill said she occasionally brought her own prior experience or research into the discussions. In week 8, for example, Merrill noted that the sampling target needs to be representative of the population that the organization is trying to reach; she referenced the country club from the week 3 discussion to illustrate her point. Later in the same discussion, she referenced collection methodologies that were not included in the articles (video games, cell phones). This, she said, came from prior research she had conducted in her undergraduate coursework. Merrill said she used these examples because they made her arguments more convincing and helped her feel like she had "a more in-depth understanding of the same concept." However, no other students responded to these examples.

Merrill said that individual posting behavior was most likely driven by "the grade of that assignment." She compared her experience in the research design course with that of the Organizational Context course. In that course, she said, she frequently posted about prior research and received feedback from others about that research. However, she

noted, this was not because the discussion was inherently more valuable or interesting to students. Instead, the reason she shared more frequently in that class was that her instructor asked her to; this was also the reason, she said, that other students responded. The expectation was for more and more engagement as the weeks went on. She referred to this trend as “destructive competition” and said it made the discussions in that class more time consuming and less valuable. Merrill said that the size of discussion groups (five to six students, as opposed to 50 in the full-class discussion in the Analytics in the Organizational Context course) also helped make the Research Design course discussions more valuable.

When it came to putting together her weekly posts, Merrill said that she wished there had been more structural requirements for the posting: “I think he should give some bullet points and we can follow the detailed instruction to put together our answer. I think I need more detailed instruction, which make us on the same page.” Her process each week was to read the discussions two to three times to make sure she really understood the point. Then she reviewed all of the articles or readings for the week, highlighting the evidence that would help her answer the questions. Then she would consider her opinions on the question and author her response, inserting evidence as requested by the instructor. In weeks where she was not one of the first students to post, she would also read the posts from other students to see if there was anything she would put in her own. Merrill noted that “sometimes the professor will ask us to reveal our past experience, and sometimes I need to combine knowledge from different areas.” If not explicitly requested, she did not include that information. However, even if this material did not make it into her posts, it was still an important part of her learning process. Participation in the discussions

provided her with “an opportunity to look back to my past experience and summarize those things.” Reflection, she noted, is difficult but critical to learning: “you have to overcome your reluctance.”

Merrill noted that she was often the first person to post to discussions. This was true in weeks 8 and 11, but not in week 3. During week 3—before Mel had switched the groups—Merrill identified another student as the group’s leader. In addition to posting first, this student leader also took responsibility for authoring a conclusion to the discussion that consolidated the group’s thoughts into a single post. Merrill said that in her second group, where she had taken the responsibility as “leader,” she was trying to perform this part of the leader role as well. She said this experience was also personally valuable because it helped her to reflect on the entire discussion.

To Merrill, a learning community is “a creative environment and it’s open. Everyone is willing to share their knowledge, their expertise, and their skills with you.” She said that the discussion forums were “sort of” a learning community. She said she did learn from others in the Research Design course and received feedback on her own ideas. At the same time, she preferred conversing in a face-to-face setting because it meant a degree of immediacy not present in the discussion forums. She referenced another class in which students worked in pairs to complete a project. Of her partner, she noted:

When I have a new idea, I can talk to her directly and she she’ll give me feedback, say ‘Yes we can do that,’ or ‘No, it doesn’t make sense.’ But in a discussion forum, they’re not reachable, I think. I cannot gather immediate feedback.

The interpersonal dimension (“expression and body language”) were also difficult to capture in discussion forum, and so made the discussion less impactful.

For the discussion in week 8, Merrill said the goal were that “we should identify the sampling, the role in that election research.” While she said she was able to do this, she was not able to meet her more ambitious personal goals of understanding the complexity of the environment and designing research to fit the particular context. “I am able to identify the sampling,” she said. “I will, in this case, just not necessarily mean I am able to identify the sampling errors in other business cases, so I really don’t know.”

About the discussion in week 11, Merrill first said the instructor’s goal was “about understanding and extracting ideas from the article.” She then said she felt that Mel intended to have them think more critically about the arguments raised in the articles. “It’s quite thought provoking,” she said. “he doesn’t want us [to] just accept others’ ideas, but need to think for ourselves to see whether there are some drawbacks of the article.” Still, while she said that the critical thinking goal was paramount to the instructor’s goals for the course, she thought that perhaps his true intention was to get them to focus on the methods and techniques.

Merrill discussed each of the instructor goals in her interview, and even added the additional goal of conversing in English. Though she said development of a way of thinking was a goal at the task level, she retreated from this when she said the goal of the final activity was actually to get students to focus on methods and techniques, a description more aligned with the goal of understanding research. Communication—both the leveraging of research as a communication tool and practicing English language—were other goals introduced by Merrill. Merrill said provided sharing her own experience as an example of where using research in communication helped to demonstrate value. At the same time, she noted that this behavior was driven by explicit instruction from the

instructor and only occurred when required. There was no notable code co-occurrence found in Merrill’s interviews.

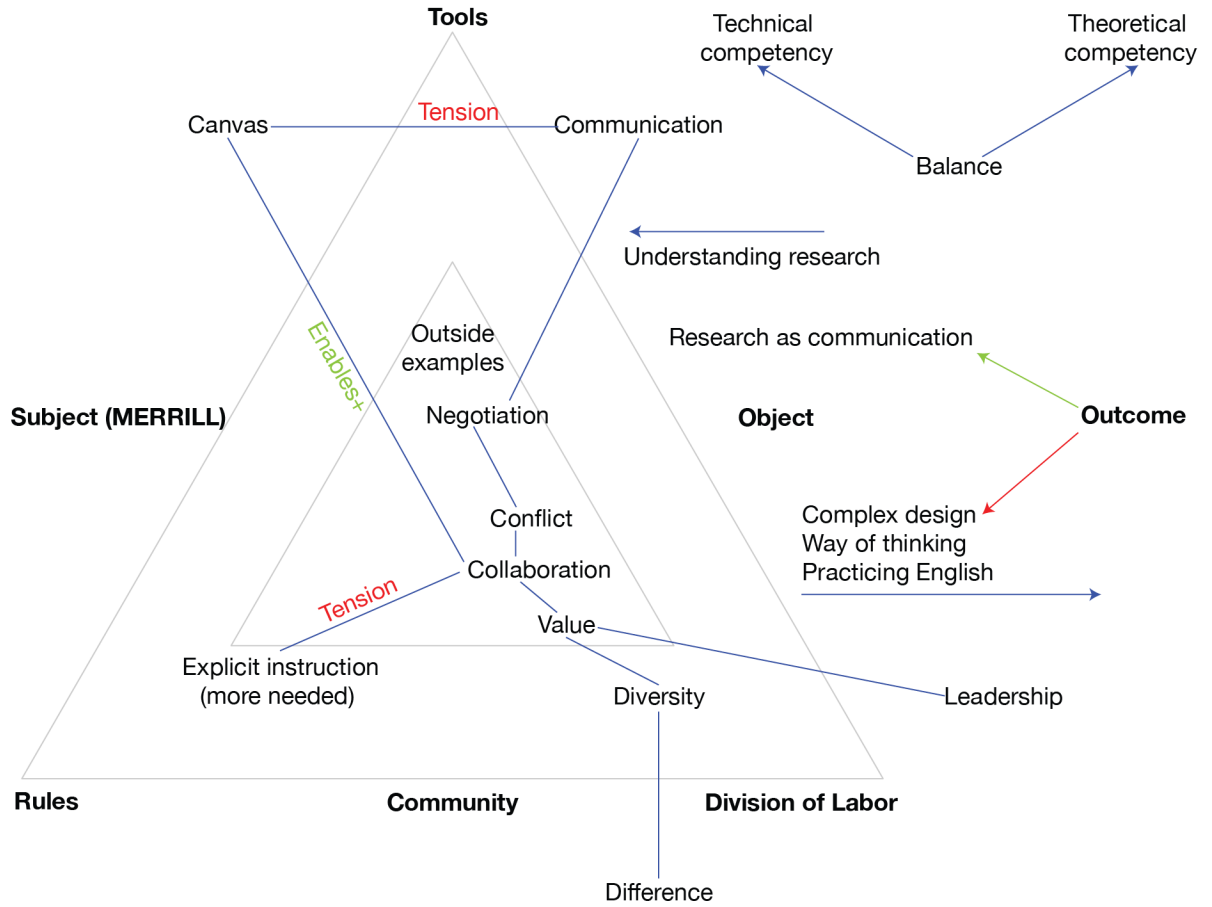


Figure 5.4: Activity system map for Merrill

**Case 4: Howard**

Howard is a 39-year old student. Though he is from China, he completed his undergraduate degree in engineering at a large public research university in the United States. He also earned a prior graduate degree in computer science at a mid-sized public research university with a specialization in technology and engineering. Since then, he has spent the last ten years working in the United States as a manager in a technology firm. In 2013, Howard took his first courses at the school in which this study took place,

when the school offered several quantitative analysis courses; these courses did not lead to a degree but were a precursor to what eventually became the analytics management program in which Howard ultimately enrolled. Howard took lessons from the quantitative analysis courses back to his organization, but found that he lacked the management orientation to move his ideas forward. He shared an example of one time waiting twelve months to get feedback from a senior manager on an idea that he had. Howard recognized that he was unique among the student population in that he was more interested in the soft skills than in the hard skills.

Howard did not have preconceived notions of what he would get from the research design course (“I can hardly imagine what kind of content it will be”), but said he could already tell during the semester that he was developing a new way of thinking about analytics problems. Previously, he said, he would jump straight into a question and immediately to data collection. Howard said he would not be surprised if he forgot all of the details of the different methods by the end of the semester, but said that the framework—the consideration of a management problem and its connection to research questions and methodology—would stay with him. He referenced an assignment in the course where students make progressive modifications to their emerging research proposal. By the second time the assignment took place “I did it and I was amazed. The entire sentiment changed. It’s more comprehensive. It’s more systematic.” In addition to this goal (referenced by Howard six times during the interviews), Howard also noted the importance of understanding research (nine times) and professional applications of the research (six times). He also mentioned the value of understanding research as a business process as a potential goal for the discussion in module 11. This was not a goal identified

by the course instructor—Patton—as part of the course or activity design. However, Howard did not engage in the discussion during this week. Howard’s attempts to meet all goals is illustrated in the activity system map shown in Figure 5.5.

During the interview, Howard described his work process for the class. First, Howard read the chapter, which he saw as prerequisite for understanding the instructor’s questions. Then he participated in the discussion. During the interview, Howard made repeated mention that he frequently missed deadlines, but said he tried to post even if he was going to be late. Howard said he liked the guidelines that were established in the instructions for each discussion forum activity. Because he had no prior knowledge of this field, he said, it gave him a way to get started, and he found that helpful. Howard also said that the questions could be treated almost like “answers,” helping to focus his reading of the prerequisite text.

After the initial posts, students began to respond to one another. As noted, Howard was often late—and sometimes missed posting entirely—but still found these exchanges illuminating. He admitted, however, that the experience of the individual needed to be both relevant and familiar in order for him to follow the discussion. Grover—for example—was a member of Howard’s discussion group. Howard felt that Grover’s examples from his career in finance were accessible and informative. “Every time, when he posts something, I may want to read it first before some other people.” Another student, however, was from the medical field. “His field is just very different than mine. I have tried to understand the vocabularies that he use, technical jargons,” but was unable. Howard said he had two “simple” and “straightforward” criteria for identifying when he would respond to another student’s posts: either the post is very

similar or else it is very dissimilar to his own thoughts. If he responded to ones he didn't understand, he said, he would ask for clarification. However, no post expressing disagreement or requesting elaboration appeared in any of the three weeks observed for this study.

Howard said that he enjoyed the structure of the discussion forums. In live class discussions, he noted, there were too many individuals which made it difficult to manage. In addition, there were "no guidelines. It's so free that everybody just jump in and everybody is head of department." By contrast, Howard said that people gravitated to following the more experienced students in the discussion forum. Grover, for example, was identified as a leader on the group. Without experienced people to get the conversation started, however, Howard did not think the discussions would have been as productive.

In the third week of the class, Howard saw the goal of the discussion activity to be for students simply to articulate what they had learned during the live class session (a "before and after" view for the instructor). But after his initial post, Howard took the initiative of going beyond what students had learned in class, crafting a method for categorizing the questions from the survey students were reviewing and offering a suggestion or how analytical methods could be used to define new ways of approaching the problem. Howard said he went beyond the anticipated scope for a few reasons. First, it was early in the semester and he felt like he had the time to explore. Second, he said, "this is an interesting case to me...this is fun." Finally, Howard said that the case reminded him of a professional experience he had once had, and he used a similar methodology for categorizing and quantifying tax information for a client. "I think [that]



this is hard to understand. I thought about another way to express the same content, like for numbers...I don't mind to do more. It's fun."

He did this again in the week eight discussion on sampling error during the polling for the 2016 presidential election. Howard said the goal of the activity was understanding research and professional application. His post—submitted three days after the due date—opens with an anecdote about 538 editor-in-chief Nate Silver's predictions about the 2017 World Series. Howard said the off-topic response was issued in part because he felt that the World Series—which had concluded the previous day with the Astros proving Silver wrong—was more timely than the election. Second, he said,

It just happened that I had this information. I remember it's probably just a day or two before I was doing this discussion and also Nate Silver, he's still one of the people that people talk about a lot, about statistics in election, so I think about him right away.

While only one student responded to the note about the World Series, several others picked up on the topic of bootstrapping that Howard introduced later in his post.

By the end of the semester, however, Howard had run out of time to experiment. In week 11, he did not participate at all. Howard said he could not contribute thoughtfully, so he would rather not write anything.

Honestly speaking, I think I skipped a couple and this one, I really wanted to do it. I don't want to put "I like it." Like I said, I really don't want to put anything that I don't mean to say. Actually, yeah, I revisited this twice. To me, this is important.

Howard said the discussion board functionality was fairly typical of what he has seen in other learning management systems. He said it was the first page he would go to in the course when he logged on because he felt the notification system was insufficient. "I think sometimes I miss conversations because I have to go back to the discussion board manually to see whether there's been a response." Still, Howard said he prefers the

discussion boards over chat tools like WeChat or synchronous meeting tools like Big Blue Button because they allow him to track progress and engagement across a group. He said even if the group requires a synchronous tool, he preferred moving to discussion boards as soon as the project was underway. This, he said, is because in “another class experience, a lot of people don't participate when they should, or they are late, or there is no control [over] when they are doing response, so that's why I prefer it to have something in writing.”

Howard's missed deadlines are important because they demonstrate the issue that Yin (2010) raised with respect to identifying the boundaries of a case. In this case, Howard's missed deadlines were due to personal issues that he was experiencing with his family. He mentioned that the problems were such that he often had to leave home to avoid distraction. Live class sessions, for example, were completed from his car parked outside of a building from which he could access free WiFi. They are also important because of Howard's reaction. Howard recognized that he probably did not have a good grade for discussion, but was still interested in following his process as much as possible. “The grade is the grade,” he said, but that was not the factor that influenced his decision to participate. Besides, he said, he was far from the only person who was submitting posts late. Howard described that there used to be 10-15 posts prior to the due date; by the end of the semester, he said, that was down to 5-6. In fact, in all three weeks observed, the posting patterns were identical: Grover would post one to two days prior to the deadline; the remaining four team members posted on the deadline, and Howard was the only person to post late. The total number of posts for the three weeks respectively: 17, 15,

and 17. In other words, Howard's perception that posting behaviors had become less rules-bound were not reflective of the observations.

The codes that co-occurred most frequently in Howard's interviews were focus with explicit instruction (5) and efficiency (5). The overlap of experience and difference of student approach (6) was the most frequent co-occurrence. The most frequent terms overlapped with tensions were time (and, specifically, time in conjunction with planning and motivation), transfer (with respect to the learning objective for professional application) and leadership. As noted, the only new objective that was introduced as a potential goal of the week 11 discussion, but Howard never engaged in that activity.

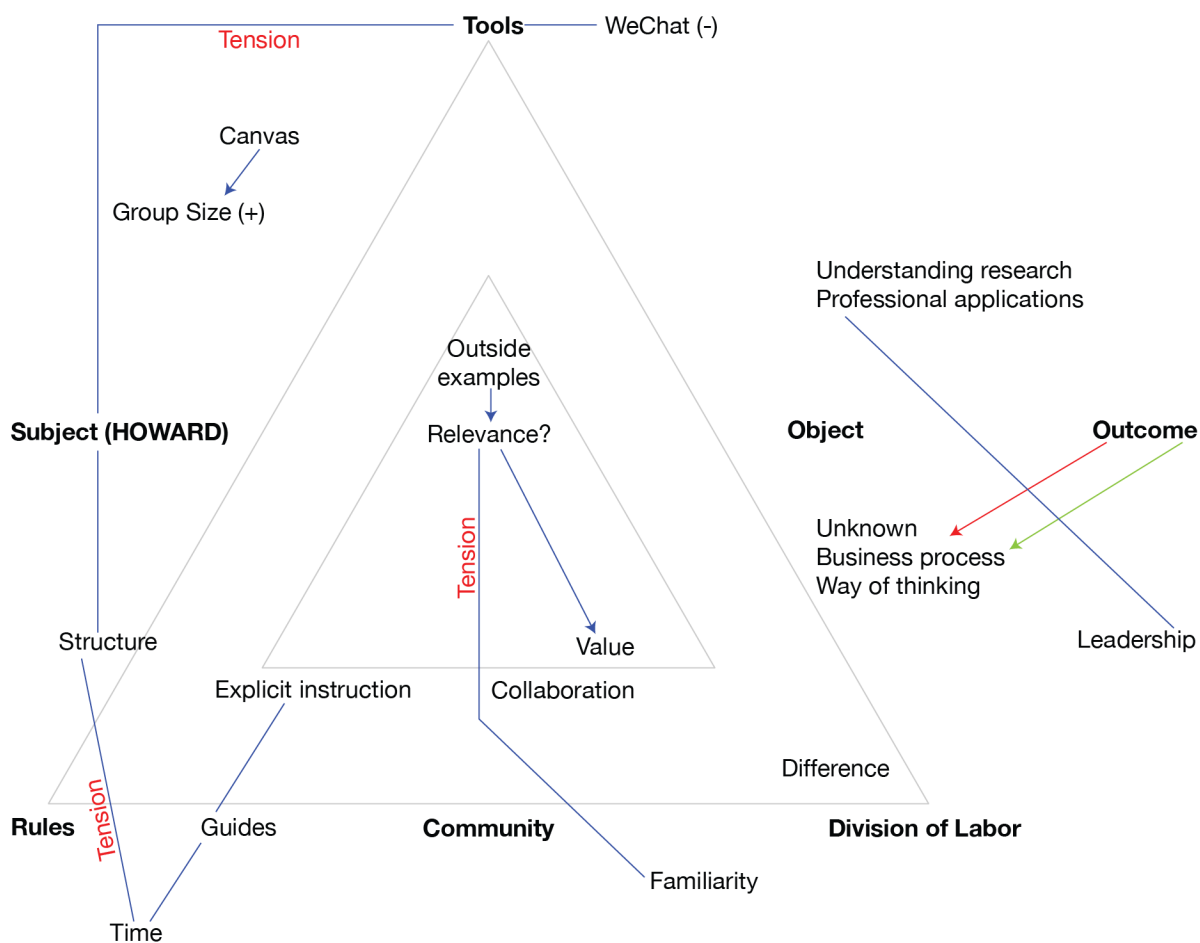


Figure 5.5: Activity system map for Howard

**Case 5: Rosemary**

Rosemary is 24 years old. She is an international student from China who received her undergraduate degree in economics from a Chinese university. After graduating, Rosemary started her own company developing software that teaches English language proficiency to Chinese youth (kindergarten through twelfth grade). Rosemary is not looking for a career transition; after graduation she plans to return to China to continue working with her company. Her personal and professional goal for the program are to develop technical competency that enables her to understand the more technically-minded employees of her company and to make more effective decisions using data. She also wants to leverage these analytics in her leadership of the organization. For that reason, she said, neither a program that was strictly focused on management competency nor one focused on data sciences would be appropriate for her needs.

Rosemary had specific use cases in mind, both for the analytics content and the research design course specifically. For example, she noted that the company has been collecting usage data about students, such as how long they are logged in or how frequently they submit assignments. Despite all of the data collecting, there have not been many discussions about how to leverage this to impact change.

We've got this data but we don't know how to use it, and we don't know how to identify which way should we improve to make these students study better. So based on the research design course, I think I can first do the investigation questions, I can ask students, and I can compare their answers to my data. And I think I can find some patterns in that and maybe after the observation or investigation research I can follow a quantitative research like running a regression model or something like that and make a hypothesis and test it. And finally I can identify the factors that are affecting the students' behavior, and then I can make my co-workers to improve these parts in our system as well as in our process of operations. And then the students can get a better education.

The instructor's goals for the class informed the way that Rosemary approached her own goals. She said that the goals were stated in the syllabus ("You will 'blah blah'") and that these goals provide "a direction." This direction, then, allowed her to see where the course would go and she was able to define her own goals to fit with what she would learn. Her goals—and the activity system that moderated her achievement of those goals—is illustrated in Figure 5.6.

To some degree, Rosemary's personal goals factored heavily into the way that she addressed the discussion questions in the class. She said that perhaps subconsciously, she would always consider how a case study or question would play out in her own organization. "The first thought of my answer to these questions are my own company, because I know my company the best and it's like the first thing I will think about."

Still, Rosemary did not explicitly bring her own experiences into the discussion. She identified two reasons for this. First, she felt that such discussion would be distracting from the instructor's focus.

Usually the details are based on a specific case that it mentioned in the textbook or somewhere. So I think we should be focusing on this case, and all of our answers should be contributing to this case...If I mention my own experience or my own company or something like that I think it might be distractions, and it might be deviating from the discussion's goal.

A second reason she did not bring in her experience was the structure of the course. While Rosemary was able to get a view of the full scope of the course by identifying patterns in weekly structure and using the course text to define a path, she also said she did not want to engage in thinking about application to her context until she had deeper knowledge of the full structure of the research design process. She compared research design to programming language; while learning and practicing small skills

might work for these more technical skills, the nature of research design made her think it would be more fruitful to learn the whole process first.

First [we] cover some observation investigation and then we cover some hypothesis test. But I think these two research factors are equally important in my opinion. And if I just know one of them and I don't know another one of them maybe I will be something like biased.

This factor also led Rosemary to select a research context for her final assignment that was not her own assignment. As a result, she said, she was confused by any request to share her own context. With three different contexts to pull from (her own organization, the focus of her study, and the case study for the discussion), she was not clear how she could communicate effectively about any of them to have others engage in meaningful discussion.

On the whole, Rosemary felt the discussions were designed so that her instructors could assess her understanding of content from the textbook. She said value emerged when there were different perspectives on the same topic in discussion. She also noted that the extended time for discussion—relative to in-class discussion—was beneficial for being able to think about the topic. However, she noted that her activity (and in her impression, the activity of others) was driven by deadlines. That meant that if students did not need to post until Monday night, they were going to wait until then to post. This crowding around the deadline led to superficial commenting. She noted that the environment was “not healthy.”

Healthy means it's an environment that is actually motivating students to actively participate in this discussion, not just using it because it is graded. It's like I want to wait others reply first and then I can see oh they are replying like this and I can reply like that too, so let's do this and we finish the homework, that's great. Like that, so I think that's not a healthy way.

Rosemary said that she would often forget to return to the discussion after fulfilling her requirement. While she knew that she was neglecting a potential learning opportunity, she “figured it’s no big deal because I have already done the minimum two.” She had trouble defining what would comprise a “healthy discussion,” but she was able to contrast her experience with healthy group activity. In a group project, the team would assemble to review the assignment. They would make a collaborative outline based on the assignment and then they would divide up responsibilities. Everybody would complete their own part and then assemble the final product. “I think that’s a very healthy group discussion and everyone participate in it using their own smart and critical thinking to develop and to contribute to this discussion,” she said.

Rosemary felt that this type of role differentiation was important to healthy discussion because it made everybody accountable to the rest of the group; if they did not complete the activity, the entire group would struggle. By contrast, she said, the discussion activities incentivize people to be lazy. Because everybody is completing the same initial assignment, a person could skip the reading and then review and copy another person’s posts. She did, however, say that she did not operate in that way because she was worried that her thoughts would be constrained by the posting of others if she looked at their posts first. Rosemary also mentioned that in a face-to-face or live class setting, the leader of the group (the person “who breaks the ice and says ‘okay let’s do this thing.’”) it is likely to be somebody who is not Chinese. She said this is because the American educational system trains students to be more comfortable speaking in class. This is not necessarily the case for online discussion forums; given this modality, she said, the leader is as likely to be Chinese as not Chinese.

Rosemary said that to understand the goal for a discussion, she often read the prompt several times. She said she thought the goal of the discussion in week 11 was to build research that was compelling and to use research as a communication tool. Given the structural and time issues above, however, the discussion did not unfold as she would have hoped. Observations of the discussion confirm her impressions of what transpired. The first student who posted suggested that the articles made a compelling case for on behalf of the HR Director. Rosemary, however, felt that the flaws in the research design made it a poor vehicle for communicating the point of the HR Director. She responded to the first student with the following reply:

I do not agree that this article makes a compelling case. The observation of this article is limited to R&D groups, while the HR is speaking in the context of the overall organization. To further create a compelling case, we should expand the research from R&D teams to other teams with different functions. Also, we should test whether the effect of gender and skills still exists.

Neither the initial poster nor any other student responded to this post.

In Rosemary's own direct response to the discussion prompt, she again said she thought there were gaps in the research. Four students replied, with three of them disagreeing with Rosemary's point. However, as Rosemary noted in her interview, the responses from her colleagues simply reiterate their points without responding to her arguments. For example, one of her colleagues wrote:

Although result of diversity depends on the novelty of innovation and industry context, I do think this article makes a compelling case on behalf of the Director of HR. [The article] shows that overwhelmed diversity of gender and skills would impose negative impacts on innovation and creativity while appropriate levels of diversity, as well as other facets of diversity such as education and firm size, do have positive impacts on innovation capabilities. In addition, [the other article] also points out that teams with diversity are more innovative and focus on facts.



Rosemary requested additional information, but received no reply. She found the exchange frustrating, but noted that structural and time limitations made the discussion futile. “So we don't continue arguing on this point. Just leave it here. Actually, I think it's not right, but we don't have the energy to do so because we have another deadline to do.”

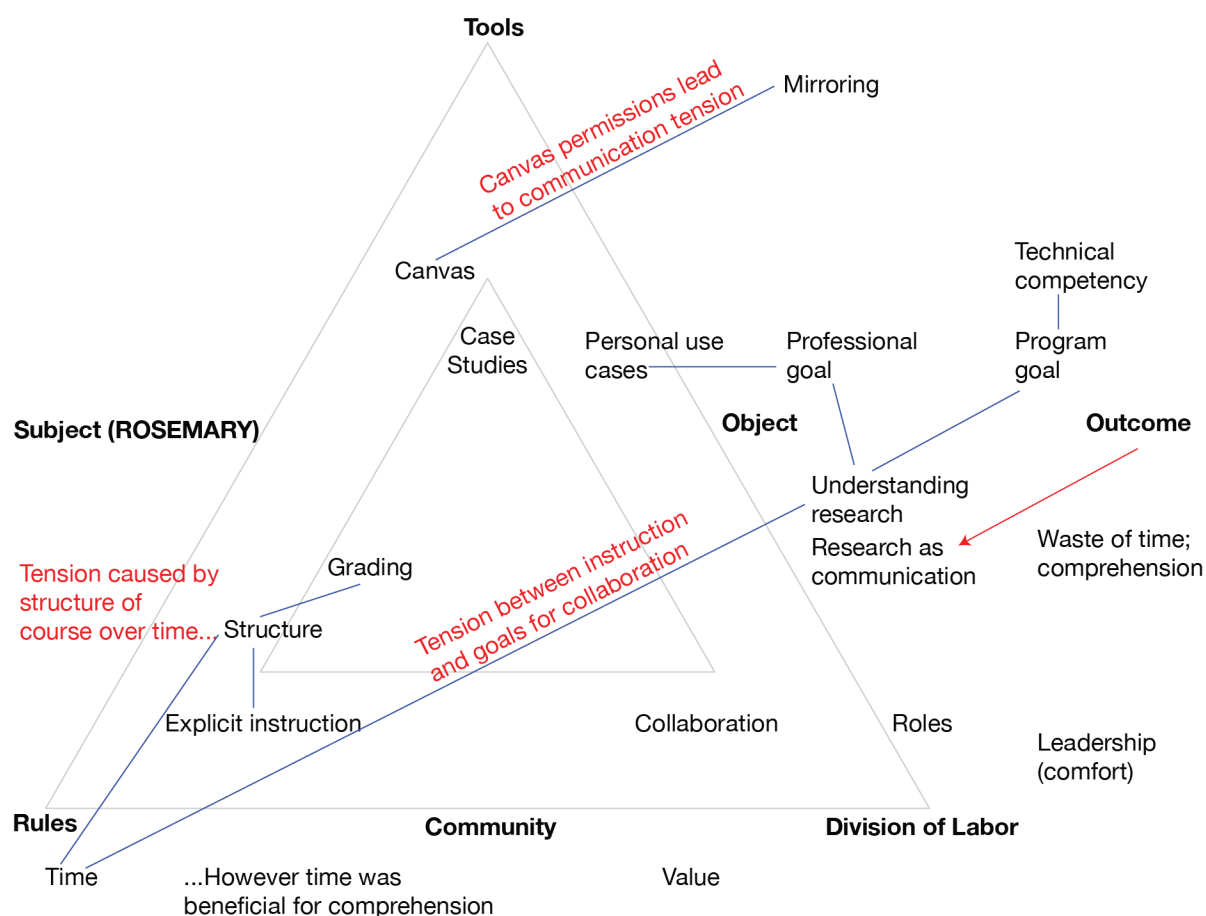


Figure 5.6: Activity system map for Rosemary

Rosemary’s only goal that extended beyond those proposed by her instructor (Patton) was the goal of research as a communication tool. She described the negotiation process in which she tried to realize this goal but ultimately felt it was not successful. In reviewing coded data, the most significant areas co-occurrence took place between tension and student process (ten times) and tension and learning from others (nine times),

indicating that Rosemary felt that there were structural impediments to her ability to learn from other students. Another indicator was the significant overlap between the code willing to share and others (38 times). Though “value” was overlapped with willingness to share five times, three other codes—tension, rules, and grading—each overlapped three times.

### **Case 6: Peyton**

Peyton is a 23-year old international student from China. He received his undergraduate in business and economics from university in China. Peyton has never worked full-time, but he has held internships in the area of international banking, working part-time for a total of under a year. He hopes to become an investment banker after graduation, and believes that the program will help provide him the skills needed to analyze a world of financial data that occupies his future profession. He cited an example from his internship experience in highlighting the need to learn data and research skills; he was asked to identify the target market for a bond that was sold by his company, and he said that knowing how research works would have helped him to identify the right approaches to answering that question. In addition, he highlighted the importance of research as communication as a critical goal for the course:

In our work, sometimes the program is not about the data analyzing itself, it's about telling the story from the data analytics to our customers, to our group leaders, or so. So that from this course, and from this program, I know how to tell stories from those data analytics. So I think that is maybe much more important than learning how to enlist the data itself.

Peyton was a student in Patton's course, notable because Patton did not identify communication as a goal for the course or activity structure of the course. Peyton's pursuit of this and other goals is illustrated in the activity system map in Figure 5.7.

Peyton found the discussions in the course helpful because of how they fit into the overall structure of the course. Peyton noted that the discussion posts were due prior to the live class session. He said he believed the instructor wanted students to read the required texts and post so that he can see “how much we...get from the preview of the next course so that they can know what they should focus on.” This was reinforced in discussion of the instructor’s goal for the week 3 discussion: Peyton said he felt that the discussion had been designed so that students could demonstrate their understanding of the “textbook material.” To author his posts, Peyton would copy and paste the questions into a reply box, answer the questions and then delete the questions and work to transition the answers so that the post was cohesive.

For his own purposes, the discussions also helped Peyton to understand what in his own understanding of the course content was still lacking prior to the class session. He noted that other participants would comment when something he wrote was unclear “so that next time I can make clear what should be included in the post, or to present my idea more clearly.” These responses came in the form of requesting more information, not explicit notes that something was unclear. Peyton said these responses helped him to clarify what remaining questions he had about the content so that he could bring them into the live class session for the instructor. Likewise, he said that the instructor asked students to return to the post after the discussion “so that, I guess I think, that he can also know what we may still lack after the course learning, in what he expects we have learned.”

The observational data for the three weeks studied is somewhat different from Peyton’s description. In week 8, for example, three students responded to Peyton’s initial

post about sampling error in the 2016 election. All three of them demonstrate agreement with no request for elaboration or further detail. However, Peyton himself performed the type of behavior he said he found beneficial from others in the discussion. He responded twice to others, both times agreeing with the overall sentiment before asking a probing question to get more detail about the specific manner in which they would approach the problem. For example:

I agree with you that the sampling should be fully random in many different aspects. In addition, I also think that making people speak out what they think is very important. However, what way do you think would help the silent ones speak out?

Another distinction between Peyton's perceptions of the activity and the actual structure came from his description of rules set by the instructor. He said that he found the instructions very clear. "For example 'you have to write three to four paragraphs' and '[this is] what you should include in your post.'" Peyton said that the instructor shared the rubric and made these expectations clear. However, a document review of the rubrics for the class found that such an expectation was never set, nor is it something that Patton said he was looking for in assessing the quality of student work during his own interview. Still, Peyton said that without this structure, discussion would be very difficult.

If there is no formal structure of the discussion, then we may just conduct a post in our own ways, so that it would be sometimes somehow more difficult for us to understand what our classmates are talking about. Because from the post structure, we can know in each paragraph what he or she is talking about, so it's much easier for us to understand his or her ideas.

Peyton said that the tool was similar to other online bulletin board systems (BBS) that he had used in the past, but said a key difference is that the Canvas discussion is more focused on a single case study. This is due to explicit instruction from the instructor to focus on the case. He said that the flexible time for participating in discussion meant

that communication was easier. In contrast, live class session discussions were often difficult because the time limits made so that students were “too hurried...to speak out an idea.” Peyton also felt that splitting students into small groups allowed them to develop a level of comfort with one another that fostered greater discussion. This was especially true when students discussed their own group projects; prior discussion afforded them a better understanding of each other’s projects.

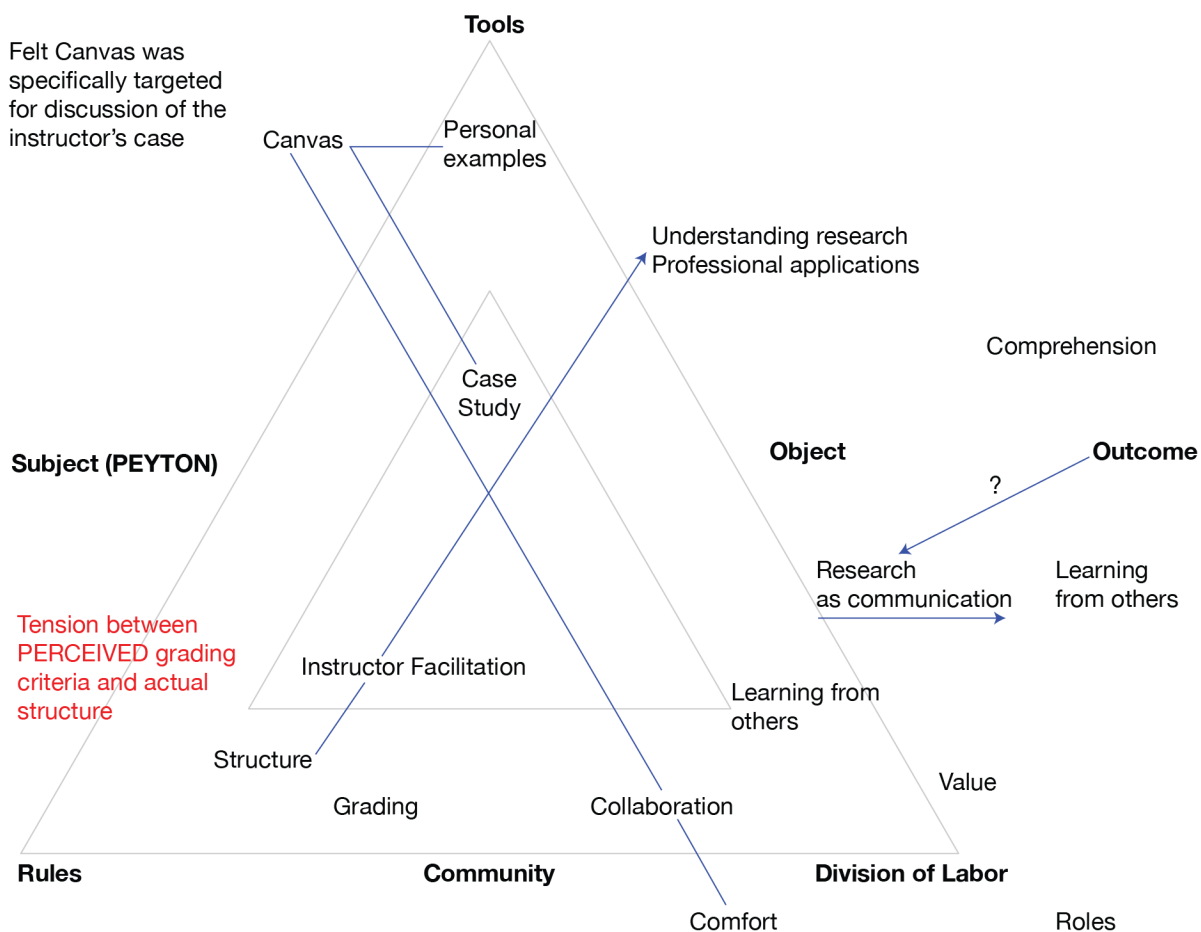


Figure 5.7: Activity system map for Peyton

Within these groups, Peyton said that students took on specific roles in the discussion. He described himself as an idea generator and said he always shares new ideas with the group. He identified another student as the leader because she always

posted last and provided a summary. However, no such summarizing behavior was witnessed in Peyton's groups during the three discussions that were observed for this study.

Peyton referenced a goal of research as a communication tool twice during his interview. Neither occurrence had any other coded co-occurrence, which was unique among the nine students. It is particularly noteworthy because coded co-occurrence was one mechanism for determining whether a stated goal had been met and—if not—what tensions may have impeded its achievement. One related indicator might be that significant co-occurrences included community/learning from others (5) and learning from others/value (5).

#### **Case 7: Grover**

A student in his early 50s, Grover has professional and academic experience that far exceed most of his cohort. Grover earned his undergraduate and a previous graduate degree in finance at large research universities before earning a doctorate in behavioral economics from an international university. He has over ten years of experience as a leader in the financial services industry. Grover believes that the degree in analytics will help him to “round out” his credentials and will give him the capacity to “speak the language” of the tech-savvy entrepreneurs that he frequently advises. His prior degrees have given him the capacity to understand the more human elements of decision making; this degree, he hopes, will provide him an additional lens for understanding “what the data actually means to people.” Though not interested in a career transition, Grover did say that he would like to begin teaching, and he thinks this degree will help make him a

more attractive candidate for adjunct positions. Figure 5.8 illustrates Grover's pursuit of these goals.

Unlike many of the other students who are taking the Research Design course in their first semester of the program, Grover was actually taking the course in his final semester of the program. He intentionally saved the course for the end because he thought it would provide him an opportunity to extend his dissertation research.

However, Grover found that such work was not aligned with the goals of the course.

Obviously, I could have just paged ahead and looked at what the final assignment was. I did not do that. The final assignment, as you know, is more of a research proposal, if you will, as opposed to the actual research results and everything else. What I was really hoping to do was cover areas that were left to be ... really areas of future research for my dissertation, and that's what I'm doing but I'll eventually do it. I just thought we would get further down the road in actually analyzing what I'm trying to analyze. So, a little disappointed from that perspective but at this ... Look, I have three other classes that I'm working full time. But I probably wouldn't have had the bandwidth anyway, you know, so it's fine.

Grover praised the discussion forums for providing "different viewpoints coming at issues and challenges...[that] just helps you to open up." Per the interview with Patton, groups in this section had been intentionally divided by experience. Grover was placed in a discussion group with more experienced professionals (which was the same group as Howard). Grover said that the diversity of backgrounds and perspectives led to the group having "intellectual chops," which he found exciting. More than that, however, he found the group to be engaging.

And I think people are, in that group, really have, I think taken it pretty seriously, which ... it's been refreshing. Because I've been in previous classes where the discussion boards, you can tell if someone is just trying to check a box and move on. Whereas, here, I think we've actually had some robust discussions.

Grover defined robust as containing "a level of acumen" about the topic of the week. As this acumen was "batted around," it could be "molded like clay" into a

collective understanding of the topic. Such exchange led to increased depth of knowing about the topic. He described it as “everybody bringing a different spice to the recipe” before pausing and correcting himself: “well, maybe similar spices, but just a slightly different recipe.”

In discussing its structure, Grover compared the group to other projects he has been in. In his capstone project, for example, students in the group each had different skill sets, so their roles in the group were naturally formed from those existing skills. Grover, for example, was quickly appointed the leader, a role he said was needed to make decisions, get others to recognize those decisions even if they are upset about them, and continue “moving the ball down the field.”

He said that in the discussion forums, however, the structure was relatively flat. Still, he said, there was an “implied hierarchy” that was based on a student’s prior experience with the topic being discussed during that week. In the case of discussions, Grover used a slightly different definition of leadership, saying it is a role in which students provide “starter ideas” and additional insight. Unlike in group projects where the students’ prior experiences are discussed up front, there was no need for a student to “signal” that they were a leader in discussion, according to Grover. “Maybe I would just describe that as, ‘Hey, this is something I’ve faced before,’ or ‘based on some research that I’ve done...’ yeah, that kind of thing.” Grover was able to tell that his leadership was appreciated when other members of the group thanked him and told him they were learning a lot from him that week.

Grover used an example from a different week as one in which he felt he exhibited this type of leadership. In this example, students were investigating hypothesis



testing and statistical analysis. In the discussion, they were asked to share how they could control for Type I and Type II errors in their final assignments for the class. Grover posted first, defining Type I and Type II errors before sharing his own plans for his study. Three other members of the discussion group opened their posts by thanking Grover for his initial contribution, either for sharing his own process or for clearly defining Type I and Type II error. He was then active in responding to each of the other students' posts, couching his suggestions for their projects in terms of his own research experience. For example:

For what it's worth, from my personal research experience, the Mann-Whitney U Test can work very well with this type of data, as opposed to a standard T-test which would be used for a normal distribution. My understanding is that under the Mann-Whitney U framework, if the calculated "U" values lie outside of the critical "U" values, then the evidence will provide a rejection of the null hypothesis. You can find MWU excel templates on the web, whereby you can "plug and play" with your dataset in order to ascertain rejection or not of the null.

In this example, Grover not only leveraged his outside experience, he did so to introduce a new topic into the discussion that previously had not been discussed. Another team member issued the single line response "Grover, I'm learning a lot from your replies this week!" In the interview, Grover said "that was nice to hear. It's really nice."

Despite the value he said was in such participation, there was little evidence of this type of leadership emerging in the other discussions observed. In the discussion for week 3, for example, each student posted their own independent response to the discussion prompt. No students responded to one another. Grover said that for the discussion in week 3, that was because students were brand new to the discussion, and didn't really understand that as an expectation. Midway through the week, however, one student noticed that the prompt called for students to reach consensus and began a new

thread. Even so, no student addressed the final prompt about how the discussion helped them in framing of their own research. According to Grover’s review after the discussion:

It doesn’t look like that was really addressed. I’m looking at everybody else ... I don’t think people saw that or they didn’t really answer it, doesn’t look like it. Looks like we stayed on point about the consensus there and never really got back to the how does your own research impact this.

The same was true of week 11. Grover said from looking at the post, the instructor wanted them to analyze the research and its fit with the organizational context in which it was presented. The discussion, however, revolved entirely around diversity—the subject of the research rather than the substance of the research. He suggested “I think we missed the point of that exercise. Or maybe some of us did.”

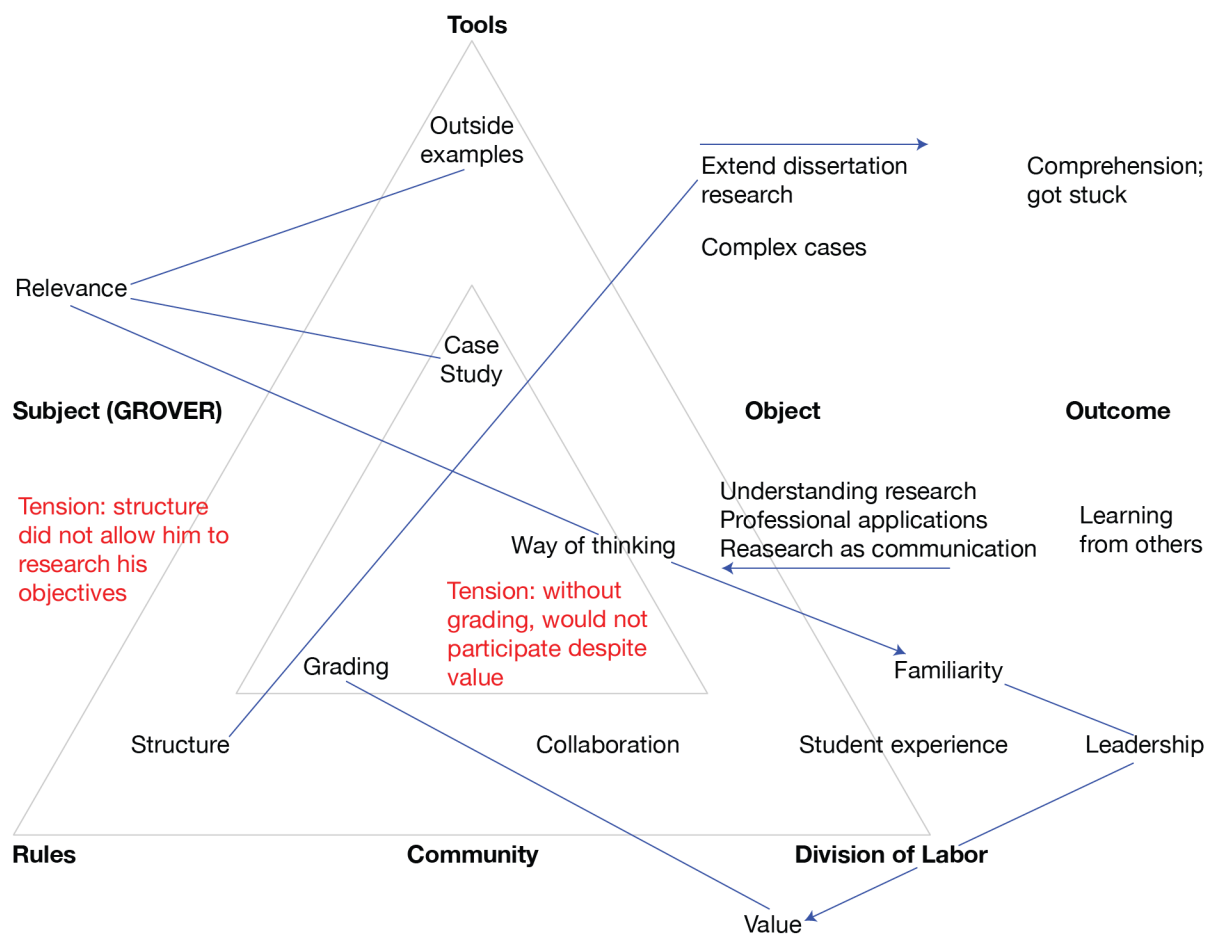


Figure 5.8: Activity system map for Grover

Grover's discussion of the group following the explicit instructions of the instructor led him to conclude that although the discussions valuable, he would not have participated in them if they were not graded. Paradoxically, he suggested he would not have known there was value in them if he did not participate, and he would not have participated if he had not been told his grade relies on it.

Grover's additional goal—completing more complex research—was identified as a goal at the course, and not activity level. He said the goal was not met because he realized it was out of scope for the existing course. Most coded co-occurrences for Grover surrounded the topic of professional experience, which were found to co-occur with career goals (4), leadership (4), difference (5), and roles (5). This indicated that the degree of student experience had a significant impact on how Grover perceived the discussion groups to be structured, with implied leadership and hierarchy following the most experienced student for any given topic of the course.

### **Case 8: Jaylee**

Jaylee is 21 and recently graduated from a comprehensive historically Black College/University (HBCU) with a degree in marketing. Although she has completed approximately six months of full-time internship experience in marketing for a global technology firm, she does not yet have experience as a full-time employee. Upon graduating, Jaylee would like to find employment as a marketing analyst, preferably for a technology company. She was in Mel's section of the Research Design course.

During Jaylee's first interview, she initially described tepid feelings about the discussions. This eventually grew into explicit dislike over the course of the interview. This is primarily due to what Jaylee described as a disconnect between the intended goal

of the discussions and the actual outcome. Figure 5.9 illustrates the tensions present in the system impacting Jaylee's goal pursuit.

Jaylee described the research design course as fitting well with her professional goals because “there are gonna be times where I might have to suggest research that needs to be done so we can learn more about the direction we want to go with marketing strategies.” In addition to highlighting the importance of understanding research and professional application, Jaylee said that the ability to use research to communicate to senior management was also an important goal. Despite identifying these three goals, however, Jaylee also made a distinction between the course goals and takeaways. During both interviews—at the middle and again at the end of the course—Jaylee said she was still confused by these ‘takeaways.’

I know there is a specific goal that the instructor has. I just moreso feel like I don't think it's directly communicated to me like, ‘These are the things you need to take away.’ I get that I can get that from the syllabus, but I don't feel like when I attend class, I don't feel like I get the feeling of anything outside of what I said. I feel like I don't get the feeling of anything else.

At first, Jaylee said that the objective for discussions were to help her “learn more about the pieces that go into the larger part.” This was a reference to the specific skills of research and crafting a research proposal—elements that are associated with the goal of understanding research. As the discussion continued, it became clear that what Jaylee meant was specific application to the larger part of her research proposal for the class final assignment. In identifying discussions she found were not useful, she described:

There's some discussions where maybe we've all had to look at the same article or something, and talk about it. We were given questions to address specific things from that article or to just talk about specific topics that are relevant to what we'll be discussing in class that week. When we're doing discussion activities of those kind, I feel like they're not as useful and helping me learn because a lot of the times, I think

that within our discussion groups, the whole purpose ... or at least what I feel should be the purpose of discussion.

In cases like this—which comprise the majority of discussion assignments in the class and all of the discussion assignments in this study—Jaylee felt that all students were being led down the same path. This lack of flexibility forced students to act in ways that prohibited difference, challenge, and engagement. This, she said, made discussions become more like an assignment than a discussion.

She used the discussion forum in week 8 (the election discussion on sampling error) as an example. “I understand the way that we can tie the elections when we're learning about sampling, but doing a discussion like that is one of those cases where we're not saying things that even keep us engaged, we're more so just repeating lots of the same things.”

Jaylee described the lack of value based on what she was able to contribute, rather than what she received from the discussion, noting “there are times where I'm in discussion and I know the difference. I really am able to understand the difference of how much it's helping me to learn about something when I can understand how much I'm able to say to my peers about what they posted.” When this happened, she said, she felt the assignments had no intellectual worth because they were not directly applicable to work she was hoping to do in the future (in her words: “there is no path”). Instead, the most useful discussions to Jaylee were those in which she was able to apply her emergent understanding of course concepts directly to her assignment; this happened several times during the course. From a counting perspective, Jaylee was almost equally productive in both types of posts, averaging just under three posts per week regardless of whether it

was focused on her own project (2.75 posts per week) or about a case study (2.62 posts per week).

Jaylee did not feel that the Canvas discussion tool impacted her ability to participate in the discussions. She said the tool was straightforward and familiar (she had previously used similar features in other learning management systems as part of her undergraduate), and no features made it difficult to use. However, she did note that the discourse that was enabled felt unnatural. When students were not in-person, she said, they used a degree of formality that did not make sense to her. When asked for examples, she noted the fact that everybody started posts with a greeting (“Hi, Jaylee”) and then everything is structured in this stunted way. “Discussion tools take away, I think, the human part of interacting with humans.” She also described time as an important element in hindering effective communication. Because students did not receive responses right away, they were forced to check back in regularly to the discussion forums.

Though she did not think that the instructors intended to set any rules for discourse, Jaylee believed that if the assignments were not graded, she would have had a more productive experience; her writing would have been more natural and the discussion would have been less serious and more impactful. She did praise Mel’s idea of changing the groups throughout the semester. She said that it made her feel more engaged. In some groups, she said, people would only respond to one another (“maybe people are friends and they feel more comfortable with people they know?”). She did not see value in watching other people talking if they did not engage her in the conversation.

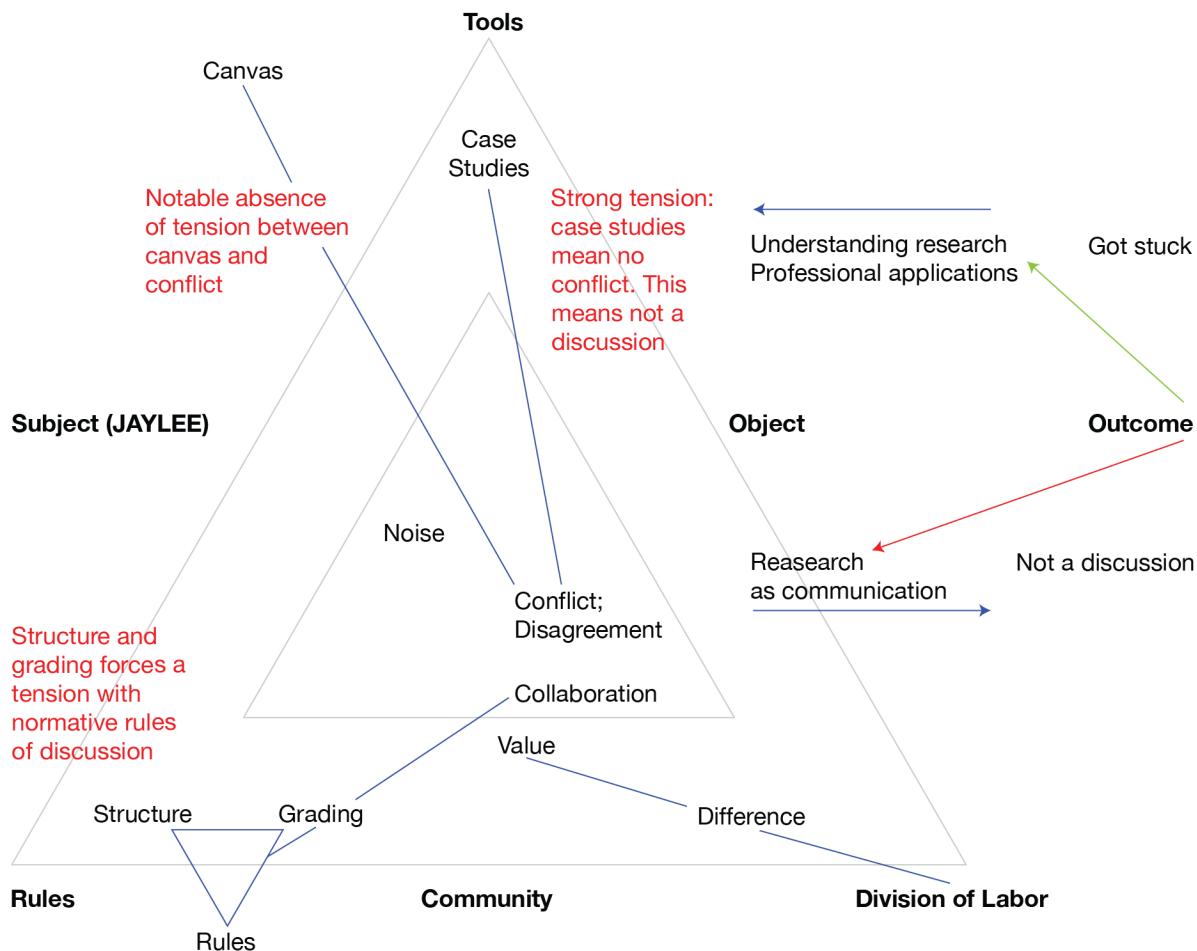


Figure 5.9: Activity system map for Jaylee

Jaylee’s interviews referenced tensions in the system more than any other individual (31 times). Most notably, Jaylee referenced tensions that were related to communication (17), tools (10), grading (9), and rules (7). These were the first indication of a potential systemic tension that has been identified below as *tool promotion of artificial discourse*.

### Case 9: Amberly

Amberly—a student in Patton’s section of the course—is a 23-year old from China. Unlike many of the Chinese students in the sample, however, Amberly’s

undergraduate degree in accounting is from a large American research university. Her prior work experience in the United States was working as an accounting intern at a national insurance company. After graduating, she wants to stay in the financial sector as a data scientist or a data analyst. She said she felt that the analytics program was specifically built for former business students because the coursework is “very business-related.” She hoped it would provide her a set of technical skills that she could use to supplement her existing theoretical/business base. During her internship, she said, she was responsible for bank reconciliation and outstanding balances; she noted that she frequently thought that if she had a background in machine learning and analytics techniques, she could quickly identify and resolve issues she faced in this work.

A friend of Amberly’s had previously told her a story about interviewing for a job with an insurance company. During the interview, he was asked repeatedly about research design questions. This highlighted for Amberly the importance of research design to entry-level analysts. “They need to write...proposals, design research, design experiments, in order to get good data to analyze.” Though her desire to learn about research design stems from a career goal, her anticipation of what she would learn was largely mechanical and related to the goal of understanding research, including knowledge of different types of experiments, measurement of significance, and potential threats to validity. She said her instructor helps her to tie these into her professional goals by giving her articles and examples from financial services. “I think it’s helpful for me to know the industry: to know what the research would be in an industry and how I can learn from this research.”



Amberly felt discussion was a useful tool for learning from others, and Figure 5.10 illustrates her pursuit of her learning goals. She said that if students disagreed with each other, it was an acceptable and encouraged practice to reply in discussion and come to consensus. She said agreement was important to effective discussion, but that she was very comfortable with conflict in the discussion process.

I would say like, if someone disagree with me, that's okay, that's just because we look at it, this topic...so it's a problem...from a different perspective. But if it's an objective question, let's say like math problem that there must be only one solution, so if I'm pretty sure I'm correct, I will show them how I get this solution so that to, convince them.

In her interviews, she referenced as an example a discussion in which students were asked to assess significance of the relationship between seat selection and flight service ratings for airlines. According to Amberly, "I just looked at the value...it has less significant effect on customer satisfaction with airlines. And my classmates saw it differently than me, and they said 'the interaction shows significant effect.'" The actual posts from that discussion reveal a slightly different story. Amberly did indeed suggest that the interaction is not significant. But she concludes her post by saying:

Although the interaction effect is not significant, we can separate it into two main effects, airline and seat selection, and their effect can be verified. As with the two-way ANOVA, the null hypothesis for the airline factor was rejected, and seat selection was also rejected at the significant level of 0.0001. This tells us airline and seat selection have significant impact on service ratings respectively at 0.01 level, and they do have a strong relationship to service ratings.

In other words, it was actually Amberly who first suggested that there may be significance. The student who responded simply affirms her suggestion:

Good post. I agree with your summarization for the one-way variance analysis. It concluded that seat selection and airline have significant impact on service ratings for the one-way variance analysis.

According to Amberly, the discussions were also designed to simulate a real-world experience, helping students to develop awareness of other ideas and then to negotiate to consensus. The ability to do this in the online discussion space was hampered by two factors. The first was the discussion tool itself. Amberly suggested that the lack of a threading feature in the discussions made it difficult to figure out where she was in the conversation.

Amberly: If multiple people reply under a post you cannot reply to them one by one.

Brian: It shows up at the bottom?

Amberly: Yes it's just added to the bottom. You can't reply to them one by one. If let's say three people leave a comment and you would like to reply to the first person that made the comment. You have to go to the very bottom and then hit the reply and then I have to say, "Hi Tom." And then Tom was like, "You are replying to me."

The second factor was time. Amberly said that she felt pressure to research and prepare prior to contributing to the discussion forums in a way she might not for an in-class assignment. Because the prompt was given ahead of time and because everything had to be written down, such activities took her a good deal of time, especially relative to in-class or in-person discussion. Despite that fact, she did say that she is more likely to remember what somebody else has committed to writing.

In a face-to-face setting, Amberly said if a group were assigned to analyze a case, they would meet in-person to discuss. The person who was the most active would naturally emerge as the leader, setting the outline for the paper and dividing up the work among the other students. After the paper was brought back together, students would have conversations about areas of disagreement and a final paper would be assembled. While this is the typical behavior of a group assignment, Amberly described her participation in the discussion board as being an individual activity, saying that after

class, students wrote their own opinions and comments offline. If there were a worthy comment on hers, she would respond. Otherwise, there would be no interaction.

Even though there was an explicit invitation to share personal experiences and research insights in the discussion, Amberly said she was unlikely to do so for two reasons. First, she said that her topic kept changing during the semester, so she never felt comfortable enough with her progress to share. Second, she said that the nature of some of the cases was such that limited disagreement meant little need for discussion. In the discussion for week 11, for example, Amberly's comments are all statements recapping what her colleagues have said and noting her agreement. Amberly said this is because "for this assignment, it is really obvious that the research has lots of limits, so everybody is making the similar points." She said this may also be related to the fact that students could not see each other's posts prior to posting. If she could have seen others' posts first, she argued, "I would have tried to differentiate my post....so I would think deeper on this topic."

Amberly did note that she had a goal to understand more complexity in research. This goal—which extended beyond those described by her instructor—co-occurred with discussion of learning from others and value. This highlighted that Amberly felt this goal could be accomplished through her interactions with other students. However, it was noted that Amberly felt the majority of her classmates viewed the assignment as individual activity, and that she felt that fact stunted conversation and impeded learning of more complex goals. Overall, however, she felt the discussion helped to better understand research concepts and textbook materials.

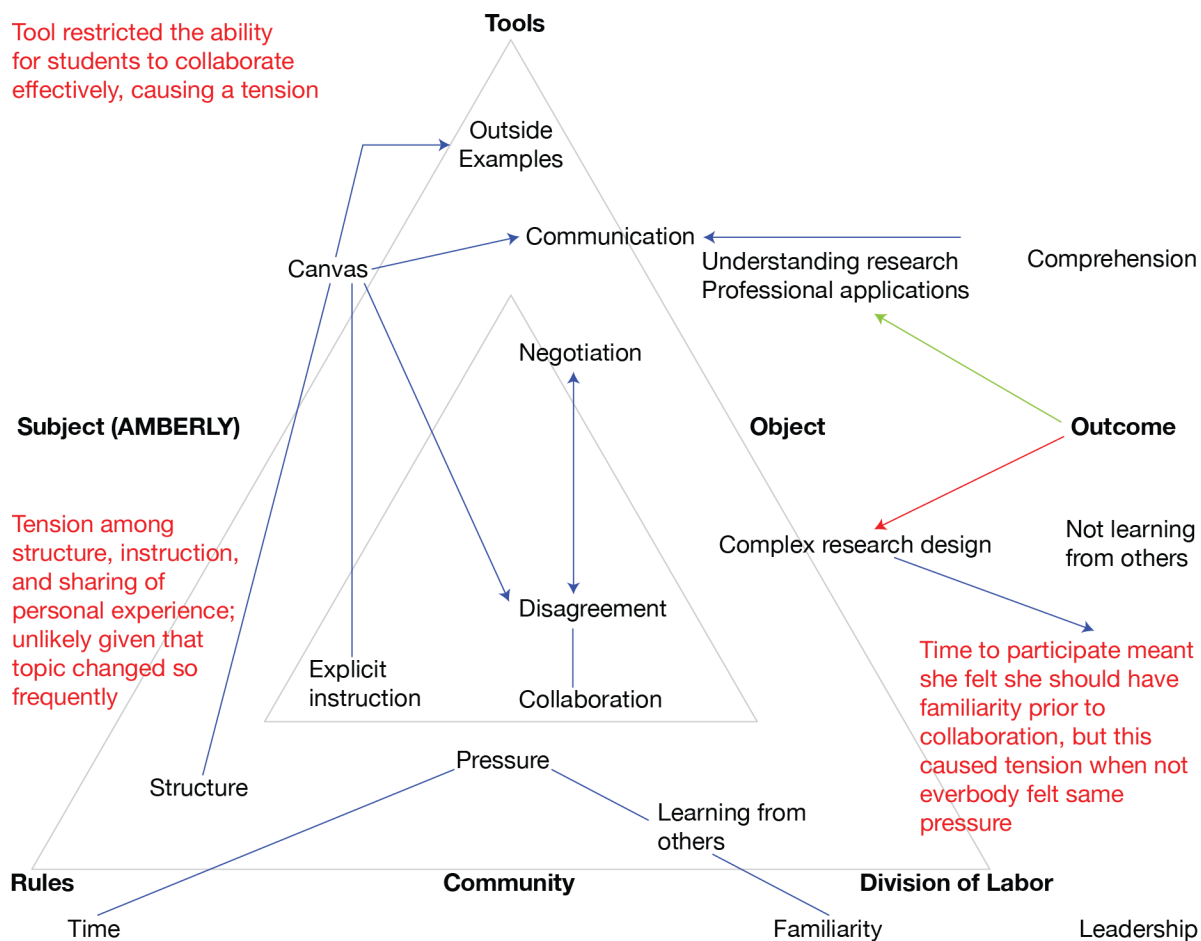


Figure 5.10: Activity system map for Amberly

### Student Outcomes Across Activity Systems

One question raised earlier in this study is whether a discernable difference can be captured between student outcomes related to instructor-defined and a student's self-defined learning outcomes. A corollary to this question is whether self-direction impacts student attainment of either set of objectives.

In the graphical representations of the activity systems displayed in Figures 5.2 – 5.10, goal placement has been identified using arrows to indicate if they are instructor-defined (suggested with an arrow pointing in towards the designed system) or student-defined

(suggested with an arrow pointing out towards the student perceived system). Many of the students had either explicit learning goals or professional practice goals that extended beyond those identified by their specific instructor. Measuring student attainment of these goals is difficult. Many of them are long-term goals that are associated with whether the student would be hireable in the future or else connected to a student's specific professional context. Also, because the instructor did not necessarily intend for student attainment of goals identified in Table 5.1, there was no direct measurement in the course. Still, many students described tensions around the goals they found it difficult to meet. For example, Grover noted a tension between his goal of following up on his dissertation research and the defined structure of the course. Six out of nine students (Wendell, Merrill, Rosemary, Grover, Jaylee, and Amberly) definitively said they struggled to meet at least one of their self-defined goals. Howard and Starla both said they met their goals, and Rosemary—although she failed to meet her learning goal of understanding research as a communication tool—was able to apply course content to her own professional context. It was not clear if Peyton met his goals. This list of students who struggled to meet the goals identified in Table 5.1 represents both high- and low-SDLI scorers, indicating that it is not possible to draw a direct connection between self-direction and ability to meet these goals.

As noted in Chapter IV, a key feature of the design process used in developing these courses was the creation of rubrics that were specifically tied to the anticipated outcomes of the instructor. This means that student scores on assignments should be correlated with their ability to meet instructor objectives. In addition to this feature of the rubrics, the course was designed to include multiple checkpoints of the summative

assignment (a research proposal) that was graded on criteria that specifically enabled instructors to see student progress towards course learning goals.

Table 5.1

*Student-Defined Goals and SDLI Scores*

<b>Student</b>	<b>Low Scores</b>	<b>High Scores</b>	<b>Goal(s)</b>
Wendell		Monitoring	Research as a business process
Starla	Motivation Monitoring Implementation	Communication	Personal goal: networking and communication
Merrill	Monitoring		Complex research design Research as a way of thinking Personal goal: practicing English
Howard	Implementation Communication	Motivation	Research as a way of thinking
Rosemary	Monitoring Implementation		Research as a communication tool Personal goal: application in her own work context
Peyton	Implementation		Research as a communication tool
Grover		Implementation Communication	Complex research design Personal goal: extended dissertation research
Jaylee	Communication	Motivation Monitoring	Research as a communication tool
Amberly		Motivation Monitoring Implementation Communication	Complex research design

If SDLI score were correlated to student attainment of the instructor's learning objective, then there should be a correlation between these scores and student performance on their scores on these assignments. Yet no identifiable patterns were present in student scores on course discussions, assignments, or the overall course grade. Further, Table 5.2 shows that there was not a clear pattern between student performance

in the discussion forums and score in the assignments. Though both Wendell and Howard struggled across both assignments, Jaylee did well in all discussions but poorly on the assignments. In addition, Amberly received a below average score on the discussion in the eighth week but not on the corresponding assignment; in the third week, the opposite was true.

Table 5.2

*Students Below Instructor Average by Assignment*

	<b>Hellen</b>	<b>Patton</b>	<b>Mel</b>
Week 3 Discussion	Wendell		
Week 3 Assign.		Howard, Rosemary, Amberly	Starla, Merrill, Jaylee
Week 8 Discussion		Howard, Amberly	
Week 8 Assign.	Wendell	Howard	Jaylee
Week 11 Discussion	Wendell	Howard	
Final Assign.		Howard, Peyton	Jaylee
Course Grade	Wendell	Howard	Jaylee

It was therefore not possible to define a direct correlation between student SDLI scores and their attainment of instructor-defined or self-defined goals. This indicates that there may have been environmental factors or influences that inhibit self-directed students from achieving their personal goals. The following section will discuss the systemic tensions that might have impeded student goal achievement.

### **Reviewing the Activity Systems Themes and Tensions**

Theming to identify tensions across the activity system was the next task in analyzing the data. This task began with two important considerations.

The first was that while the code of “tension” could be used as an indicator of where a tension might exist in the system, tensions needed to be identified more holistically and the *tension* code could not be relied on exclusively. The reason for this is that tension sometimes emerged across cases, but might not appear as a tension within a single case. This occurred when a phenomenon or event was described by an individual, but it was not possible to code the phenomenon as a tension without context that was presented in another case. Examples of this are described in Table 5.3 below. For example, the critical role of time was revealed across interviews and observations with Grover and Howard. Grover felt pressured by looming deadlines to participate in discussion early, and always posted prior to the discussion due date. As discussion unfolded over a full week, Howard would often come in later. This meant the two had limited interaction with one another. As Howard put it, “he posts first, and very early, but if you think about I don't know him at all. I only read his posts. I don't even have a conversation with him, not a single time. I don't know this person.” As a result, Howard said he was less likely to post about topics or questions that were not directly tied to course content. This highlighted a tension linking the time, community, and willingness to share that might not have emerged in looking at only one of these interviews. A second example was the link between tool settings and rules for natural discourse. Jaylee commented on the need for formality in the discussion posts. Peyton described feeling that the discussion tool was difficult to use because new student posts did not thread, but instead went to the bottom of the list. It was not until Amberly connected these two ideas—saying that students needed to identify the target of their comment because the threading did not function



properly—that a theme about the role that tool settings play in discourse began to emerge.

Table 5.3

*Events Requiring Context from Another Case*

<b>Event</b>	<b>Context</b>	<b>Tension</b>
Howard—despite noting that he saw values in Grover’s examples from the finance industry— noted that he had limited interaction with him and therefore did not feel he knew him well enough to share stories about his own professional experiences.	Grover describes that the multiplicity of deadlines across the course meant that he had to post early in the week.	Structural and temporal disjuncture
Jaylee complained that the discussion was unnatural. For example, all discussions began with formal greetings. This made it feel like an inauthentic discussion.	Peyton noted that the threading features on the discussion tool meant students could not tell to whom posts were directed unless formal greetings were included.	Tool promotion of artificial discourse
Several students (Starla, Peyton, Grover) described the importance of learning from others.	Several students (Wendell, Howard, and Jaylee) describe a preference for processes that do not require collaboration.	Learning from versus learning with

A second consideration was that the activity system needed to be examined more broadly. The course structure—its learning objectives and assignment deadlines—seemed to be a significant factor impacting the ways in which students behaved in the course. Likewise, external factors—such as Howard’s family issues or Starla’s extra-curricular efforts to integrate into American culture—also influenced how individuals approached the discussion activities. It was necessary to consider the environment—both an

individual student's environment and the broader course structure—in identifying themes and tensions in the system.

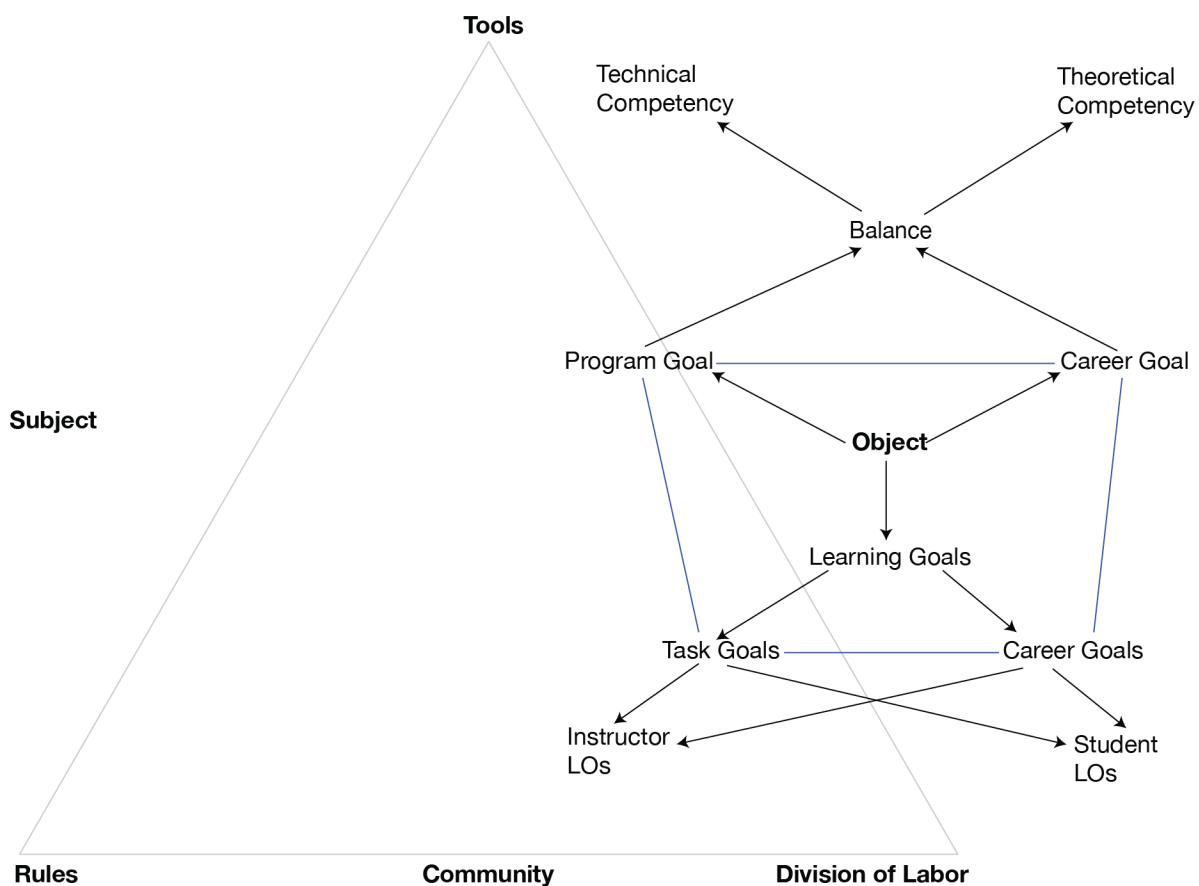
Across the cases, the following five tensions were identified: (1) goal confusion, (2) tool promotion of artificial discourse, (3) role definition by comfort, (4) learning from versus learning with, and (5) structural and temporal disjuncture. Each of these is discussed below.

### **Tension 1: Goal Confusion**

During interviews, students discussed different levels of goals. All nine participants described goals that were related to their career, such as needing to integrate a degree of technical acumen into their existing knowledge in order to move into a new job area. This bridging of technical and theory was also identified by all nine students as a potential program goal. Program goal was identified as unique from career goal in that it was often framed as a statement of why students wanted to participate in such a program, rather than what they hoped to get out of it. Grover's hope that he would use the program to engage in research that was part of his dissertation or Starla's interest in extra-curricular opportunities afforded by the program are examples of program goal. At a more granular level, seven of the nine students spoke about goals that were specific to research design (course goals). These often occurred simultaneously with career goals, as when individuals wanted to learn to develop research proposals (course goal) that they would use in professional settings (career goal). Finally, all nine students spoke about task learning goals that were often distinct from program and career goals.

This multiplicity of goal levels—illustrated in Figure 5.11—caused a tension that is defined here as goal confusion. Goal confusion was the inability of students to navigate

across goal levels. Even when students were able to differentiate and identify specific goals, their default behavior was to treat all activity instructions as goals in and of themselves. Therefore, for example, the goal of discussion was to answer the instructor's prompt. This type of goal confusion manifested itself through either student inability to describe outcomes or missed goal achievement.



*Figure 5.11: Goal confusion in the activity system*

**Inability to describe outcomes.** Five of nine students described feeling unable to articulate the goals of the course. The most frequent expression (occurring three times)

was a confession that the student did not have a good sense of the incoming goal (Jaylee, Starla, Howard). The other two students (Peyton and Rosemary) had not previously thought about the fact that they were unaware of the goal (as Peyton put it, “I think, for me, it would be like...maybe I have to think a little about this.”). Three students (Wendell, Jaylee, and Starla) expressed that even when the goals and objectives were stated, they still found themselves unable to identify the key takeaways. The distinction between learning outcome and takeaway was never explained (attempts at explanations appear in Table 5.4), though all three repeated it several times during the interviews.

Table 5.4

*Examples of Goal Versus Takeaway*

<b>Student</b>	<b>Section</b>	<b>Quote</b>
Wendell	D05	The expectation the professor, for everybody, it wouldn't be the same, it varies. So my thing is that at the end of the semester, what is the key takeaway?
Starla	D07	Our instructor, he's very nice, he told me, gave me some instructions and some reading materials to learn so that I have a clear structure about it, and actually that I think I need to know what I'm learning about. That's the most important question, because sometimes we are just focusing on the details and we've lost the main principle.
Jaylee	D07	I believe I know where to find [objectives] in the syllabus, but I think that in terms of the key takeaway that I needed to pull through the course, I'm not exactly sure that I have some thing I got to do.

In all, six of nine cases included some degree of expressed confusion about the incoming goal. Students demonstrated confusion during both their first and second interviews. As Jaylee remarked “I would say I feel the same as what you said I told you previously.”

**Missed goal achievement.** A second manifestation was that students failed to identify the outcomes of the activity even after they completed them. This tension occurred at the task level and could be expressed as a tension between the outcomes and the rules (instructions) for a given a task. This appeared most frequently (as demonstrated in Table 5.5) when students spoke about the discussion in week 11.

Table 5.5

*Description of Goals for Week 11*

<b>Participant</b>	<b>What is the goal for the week 11 discussion?</b>
Hellen (instructor)	<ul style="list-style-type: none"> <li>• Understanding research</li> <li>• Professional applications</li> <li>• Complex research designs</li> <li>• Research as a communication tool</li> </ul>
Merrill	<p>“First he wanted to be able to read the article, and to summarize or synthesize the main point of the article...”</p> <p>Brian: ...so the questions that you are talking about are questions about your own impressions of the importance of diversity? Is that accurate?</p> <p>Merrill: Probably, yeah.</p>
Jaylee	<p>“When I go back and I look at the questions that we were asked to answer to support for our post...I feel like looking at the prompt and then looking at the questions, I almost feel like there’s a difference... I think sometimes there becomes a difference between the way that we answer the questions that are asked and the intention, the way that we’re supposed to.”</p>
Grover	<p>“I don’t know. I think we missed the point of the exercise. Or maybe some of us did.”</p>
Peyton	<p>“Goal of this activity? Can I say I have no idea?”</p>

The discussion in week 11—as noted by Hellen in Table 5.5—was an opportunity for students to explore the complexity of business research by analyzing the quality of two competing articles on diversity and considering how the research could be

restructured to address potential issues that might be raised about its fidelity. It also invited students to think about the questions that might be raised about their own research designs. Yet students found themselves stuck in the context (discussion of diversity) instead of focusing on the research-related outcome. Merrill insisted that diversity was indeed the focus of the question, even when confronted with the question of how that topic would fit in with the overall course goals. Jaylee and Grover, however, recognized perhaps they had not met the goals of the activity.

In all, eight of the nine (all but Amberly) interviews expressed some form of goal confusion.

### **Tension 2: Tool promotion of artificial discourse**

A second tension that was identified across individuals was the promotion of “artificial discourse” in the activity system. This was caused when the affordances of the tool being used for discussion ran afoul of societal norms for effective discussion. Though no student explicitly described broken rules of discourse or cited any of the rules below, several did say they felt the activities ‘were not a discussion’ and expressed confusion or feeling “unnatural” when rules were violated. This relationship among tools, rules, and outcomes is illustrated in the activity system in figure Figure 5.12 below. As a field, discourse analysis has established rules that govern discussion. H.P. Grice, for example, established a set of maxims that comprised felicitous communication (1975). Breaking a maxim is itself telling because individuals look to these rule violations for meaning. For example, if an individual were to directly ask another person a question, the maxims of quality and quantity would govern that the response should be substantial enough to answer the question. Yet Table 5.6 shows that in the online discussion forums,

these maxims are routinely violated. For example, participants in a discussion all answering the same prompt—as opposed to having initial reactions that build on one another—could itself be seen as a violation of the maxim of relation, which states that each individual’s contributions should “be appropriate to immediate needs at each stage of the transaction” (1975, p. 47).

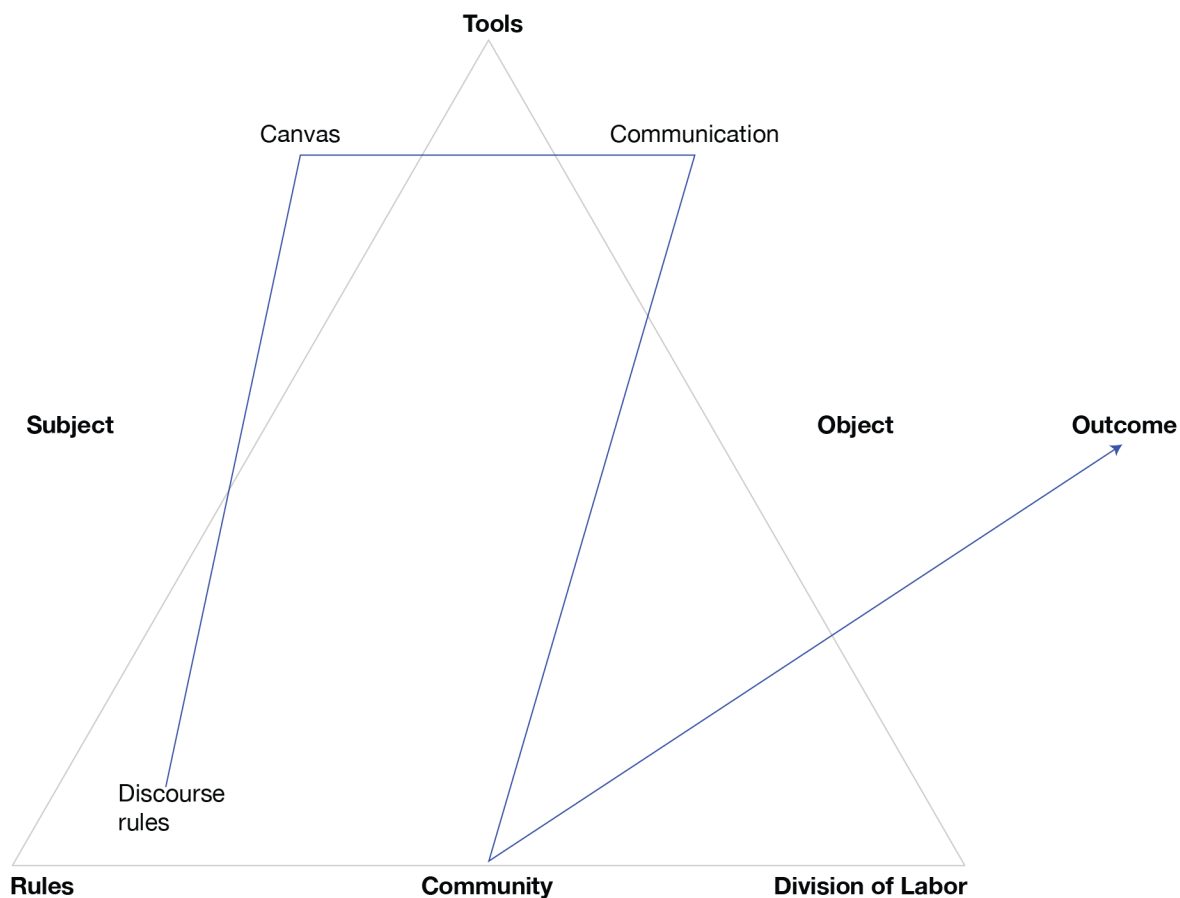
Table 5.6

*Violations of Conversational Maxims (Grice, 1975)*

<b>Maxim</b>	<b>Description</b>	<b>Cause of Violation</b>
Quantity	Make sure posts are as informative as required (and not more so)	Lack of immediacy may be interpreted as a non-response  “Destructive competition” may make posts longer than needed
Quality	Make sure turns are true and evidence-based	Lack of immediacy/notification system may mean non-response to questions or challenges (“not a discussion”)
Relation	Ensure each turn is relevant to the conversation (and prior posts)	Not seeing the posts of other students prior to posting  Threading makes it difficult to ascertain turn order, clouding relationship to prior post
Manner	Avoid confusing language and be orderly	Threading in discussion tool requires greetings that students describe as “unnatural” or awkward

Another discourse analysis rule that is routinely violated in the discussion is the rule of turn-taking. Turn-taking (Sacks, Schegloff, & Jefferson, 1974) describes the rules that govern how—within a conversation—the role of speaker moves from one individual to another. The authors also defined a set of expectations for how these turns unfold, for

example, that first turns contain greetings, and that subsequent turns should be based in part in what happens in the preceding turn.



*Figure 5.12:* Impact of tool and rule on community and outcome

They may seem like intuitive rules, but in online discussion forums, the tools often constrain the speaker to behave in ways that run counter to these norms. Though they did not all immediately recognize that their concerns were caused by constraints of the tool, six of the nine students commented that the activities were not discussion. Three factors influencing the tool-rule tension were: immediacy of reply, threading, and seeing the posts of other students.

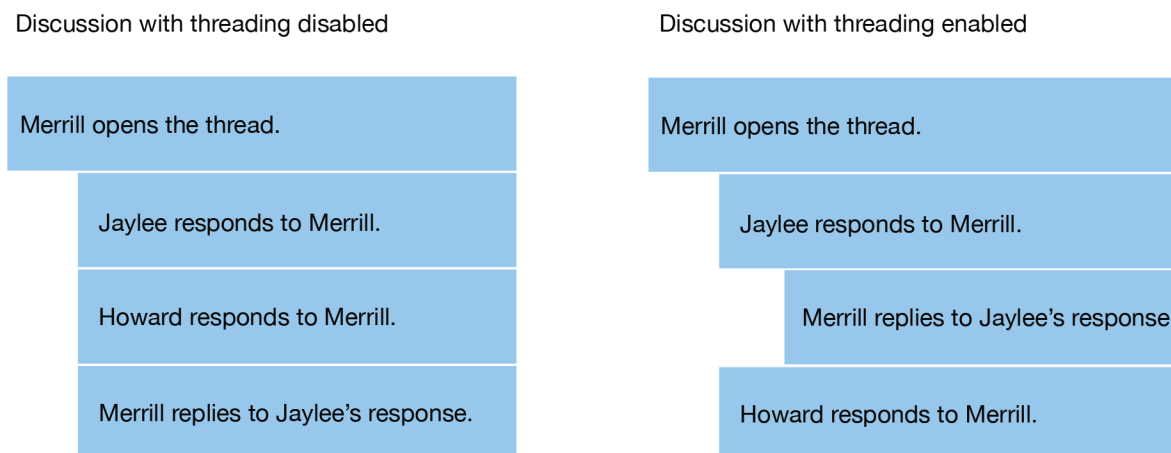


**Immediacy of reply.** Five students said that the time it took to receive responses from other participants in the discussion was a hindrance to their ability to engage with others. Students compared the discussion to live discussion activities or to other tools they used for synchronous chat (Big Blue Button or Skype). Jaylee noted that the one- to two-day gap between students posting and receiving replies made it difficult to keep discussion moving. The turn-taking literature provides significant discussion of why gaps in turn-taking might occur; if, for example, somebody identifies the next speaker but that individual opts not to respond, a gap occurs letting the rest of the participants know that they can self-select to speak (Sacks et al, 1974). Yet in these discussions, the gaps occurred by virtue of the fact that the tool is asynchronous. In other words, the lapse may not be a signal like it is in traditional discourse.

Further complicating the complaint about the lack of immediacy were concerns about the notification system in the Canvas LMS. Canvas automatically subscribed students to discussion forums in which they have posted. The system notification therefore let students know when a new post had been made in the discussion, but it did not tell them whether the post had made directly to one of their posts. Peyton said these notifications were often ignored because students could not immediately tell if their work was being referenced. Jaylee agreed with this, saying that she has to go into the forums regularly and “manually to check whether there’s been a response.”

**Threading.** In discussion forums, threading is the feature that dictates where a post appears in the sequence. In Canvas, there is an optional setting in the discussion forum to enable or disable threading. Each student who responds to the initial post starts a new thread. If threading is disabled, then each subsequent post would go the bottom of

the thread to which it is a response. If threading is enabled, then each post directly follows the posting to which it is a response. In the hypothetical scenario illustrated in Figure 5.13 below, Jaylee and Howard both respond to Merrill, in that order. Then, Merrill replies to Jaylee's comments.



*Figure 5.13:* Illustration of threading

In the discussions in the Research Design course, threading was turned off. That meant that students needed to explicitly identify to whom they were speaking. Three individuals (Jaylee, Amberly, and Peyton) expressed that this caused difficulty, both because it caused a degree of formality that felt unnatural (Amberly and Jaylee) and because it made posts difficult to find and identify (Amberly and Peyton).

**Seeing the posts of other students.** Another feature in the discussion forum settings enables or disables a student's ability to see the posts of other students prior to posting their initial post. Each of the sections started the semester with this setting allowing students to see posts, but Mel turned this functionality off during the semester.

Five of the nine students (Starla, Amberly, Howard, Rosemary, and Merrill) talked about this functionality, though there was disagreement among the five about whether it was preferable. Rosemary and Howard both said that seeing the posts of other students constrained their own ability to think freely about the content. However, Howard also said that he leveraged these posts when he did not understand something or needed additional clarity about the discussion. Amberly was in the section that did not have access to see posts from other students. She said she wished she had because of the artificiality caused by everybody answering the same prompt. If they were responding to each other instead, she suggested, there may be greater opportunity to highlight disagreement and encourage to debate.

### **Tension 3: Role definition by comfort**

A third tension present in the system had to do with the way that students divided labor in the discussion, especially when it came to selecting leaders and defining their own role in the community. This tension is illustrated by Figure 5.14, the inset of the broader activity map associated with roles and community. One important element contributing to perceived value in the system was diversity driven by student difference. Disagreement was widely seen as a contributor to healthy collaboration. For this reason, student difference was specifically referenced in the activity system map as a link between division of labor and community.

Despite this espoused appreciation for ideas that were new, students established roles and processes that appeared to be based more on reinforcing comfort than on embracing difference. This was true of qualities and roles that were attributed to other

individuals—emphasized by the notion of ‘natural’ leadership—as well as roles that students took on themselves.

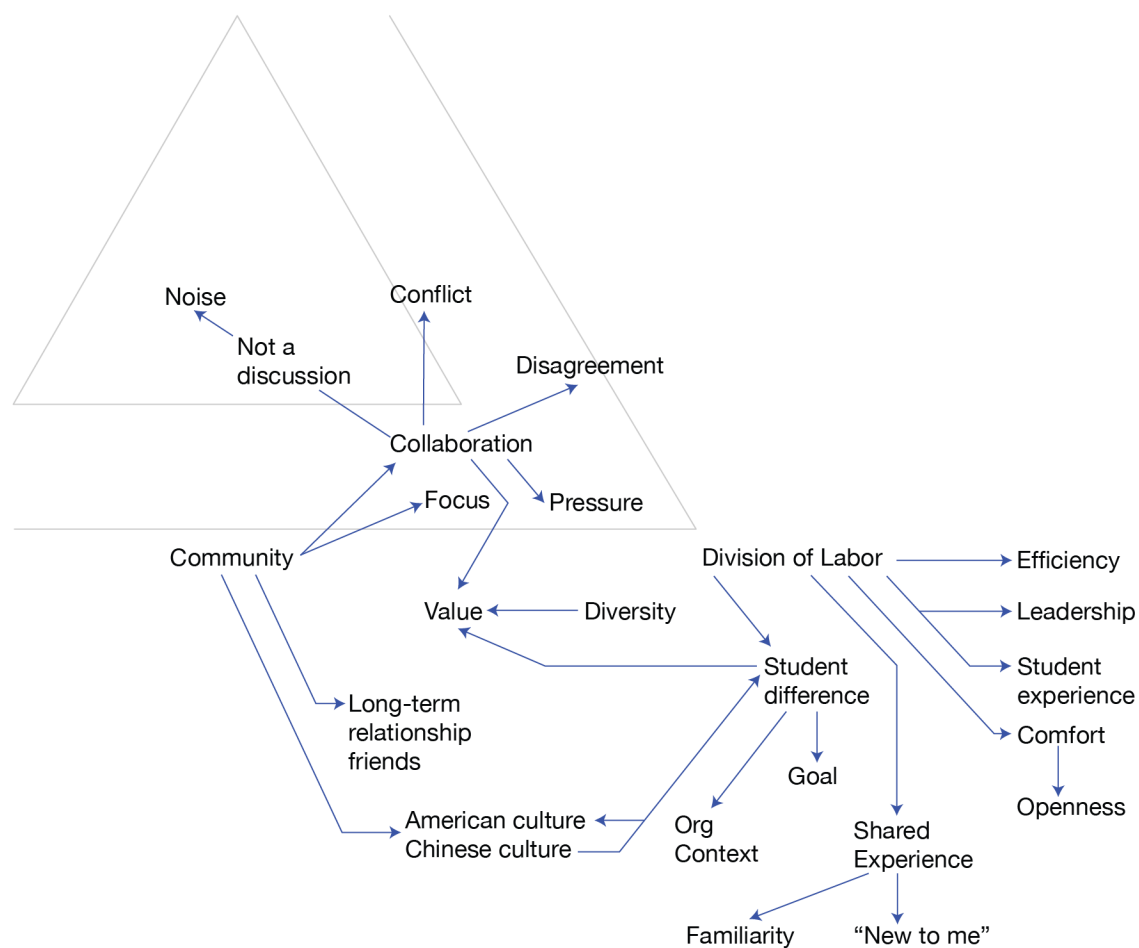


Figure 5.14: Inset of student difference in activity systems map

**Roles attributed to others.** Five of the nine individuals (Howard, Starla, Rosemary, Merrill, and Peyton) talked about ascribing the role of leader to another member of the group. The five members did not necessarily agree on what the leader was actually responsible for. Howard, Starla, and Rosemary all described a leadership role in which a leader was the first person to speak their opinion; Merrill suggested the leader was responsible for setting an agenda and dividing responsibilities, while Peyton said the

leader was the person who wrapped up the discussion and offered conclusions. Jaylee said the leader was one who “filled in” the conversation when gaps emerged. What was consistent, however, is that all five described leadership as a naturally occurring phenomenon, using words such as “naturally” or “automatically” to describe how the leader was identified.

Rosemary identified English language proficiency and American cultural identity as potential characteristics influencing leader selection in face-to-face settings, saying that such individuals are more comfortable being the first to speak. In an online discussion, she said, no such barrier existed so the leader might just as likely be Chinese. She said the emergence of leadership would still be the same process regardless: “someone just stands out. Everyone just [says] okay, that’s okay. And we move on.”

Howard—who was in the more experienced section—attributed leadership to Grover and one other participant who did not elect to be interviewed. He suggested that experience level and prior mastery of content was a significant contributor to perceived leadership. He also noted that these individuals usually posted first.

**Roles adopted by students.** If leaders were those who had more experience and were most willing to share early in the discussion, the attribution of leader by others is especially interesting in light of how individuals identified comfort and role selection within the discussion. Only Merrill and Grover described themselves as leaders in their respective discussion groups, but seven students (Merrill, Grover, Howard, Jaylee, Rosemary, Amberly, and Wendell) talked about feelings of comfort related to sharing personal details in the discussion.

The two students who identified themselves as leaders said that existing expertise was the most significant contributor to their leadership within the discussion forum. Grover even suggested that leadership was transient and followed the expert in an “implied hierarchy” that changed week to week.

Though the other five individuals did not describe themselves as leaders, they did echo the sentiment that establishing comfort and safety was important to posting. Four of the five described feeling more comfortable in a small group than in a large class setting, where it was relatively safe to fail. Wendell and Howard—the two experienced students who did not self-identify as leader—both described the need for professional self-preservation within the discussion forums. Per Wendell:

It’s more like it comes down to protecting your image so you really got to learn the material and know what you’re talking about. If there’s anything that’s wrong, someone asks hey why did you put this, why do you do that? Be able to provide them with an answer.

If individuals were more likely to post early and often if they possessed existing knowledge of a topic, and other individuals would ascribe leadership to those they saw posting early and often, a conclusion can be drawn that leadership attribution was at least in part based on what people knew coming into the class. In other words, role attribution in the current system reinforced existing knowledge.

#### **Tension 4: Learning from versus learning with**

Students were asked questions about their goals for group participation, their perceptions of the term ‘learning community,’ and their experiences as part of effective group discussion. Their answers reflected that there existed in the activity system a tension between individuals who were learning from others in the community and

individuals who wanted learn next to—or, with—others in the community. Further, there were some individuals whose espoused value for team was one of collaboration, but whose actual descriptions of healthy team functioning was one of learning with, rather than from. These distinctions form the basis for a fourth tension: learning from versus learning with. The distinction between these constructs is explained table 5.7 below. Learning from others means a value on building shared knowledge through efforts to reach consensus on areas of disagreement or debate. In contrast, Learning *with* others means perceptions of value are based on an individual's own contributions. Strict divisions of labor in which students do not work together on an assignment are also examples of learning with as opposed to learning from.

Table 5.7

*Learning from Versus Learning With*

	<b>Behaviors</b>	<b>Cases</b>
<b>Learning from</b>	<ul style="list-style-type: none"> <li>• View difference of opinion as critical</li> <li>• See negotiation as central to learning process</li> </ul>	Starla Peyton Grover Amberly Rosemary
<b>Learning with</b>	<ul style="list-style-type: none"> <li>• Do not see discussion as group work</li> <li>• Prefer strict division of labor</li> <li>• Have personalized goals that do not necessitate collaboration</li> </ul>	Wendell Howard Jaylee Amberly Rosemary

It is because those who value learning from and those who value learning with must coexist in the same discussion system that this is labeled a tension. Rosemary, for example, described being unable to meet her own goals because other participants did not treat the discussion as a collaborative assignment. Without a shared understanding of how

value was generated in a discussion, it was difficult for individuals to meet personal learning goals.

The opposite argument from students was stated succinctly by Amberly when she was asked about group function: “we don’t really have group work.” Five students described experiences or impressions of group work that indicated it is more likely to be effective as individual activity co-located with other participants. Four of the students described processes for working in ideal team environments in which assignments were split by expertise and interest and individuals worked on their own part before coming together to compile a final project. Wendell and Jaylee both described very personalized learning goals for discussion that did not necessitate collaborative learning. For example, Wendell said the goal of a learning community was to “grow based on things you need to be aware about.” He said when questions emerged for him, he would often ask his course teaching assistant in private rather than risk posting them publicly to the forum for others to see.

These two perspectives were not seen as mutually exclusive by students, with two individuals (Rosemary and Amberly) saying that discussions were helpful for sharing diverse perspective and simultaneously looking to division of labor as a mechanism for building healthy collaboration. Among other students, there is an unavoidable irony established in this tension. Rosemary suggested that student perception of discussion in online classes was that it was not actually a discussion, saying:

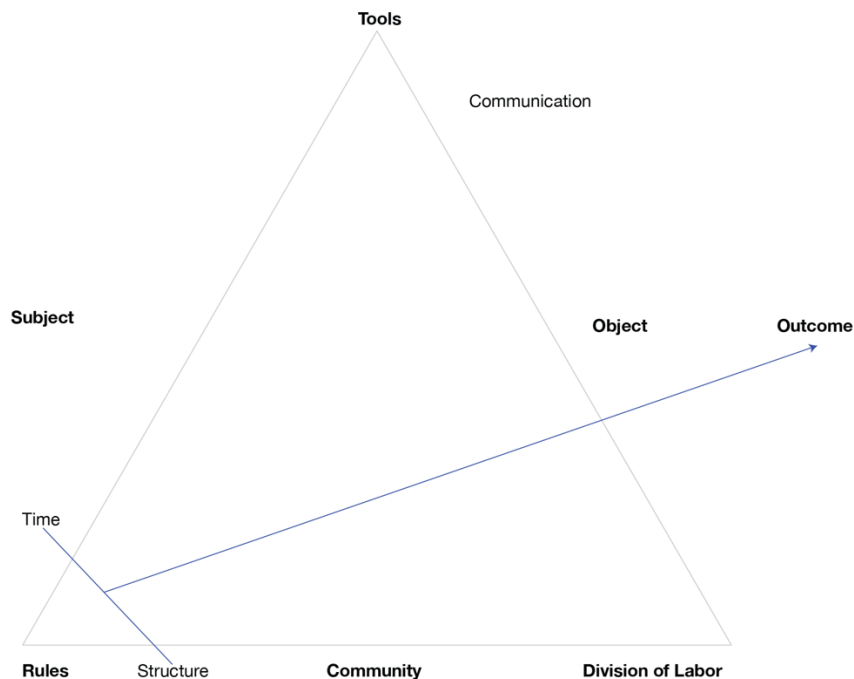
I think the environment in the discussion forum is most likely an assignment for obtaining the grade. It’s not like we are making our efforts to learn from each other and to contribute our own opinions to a community. We are just replying this forum because we are asked to, and what we have posted even though it is different is because we just think differently.



At the same time, she defined healthy collaboration as students coming together, dividing up a project, and then working in isolation on their own part.

### **Tension 5: Structural and temporal disjuncture**

As a term, course structure includes the flow of topics—and therefore the concepts and content contained in those topics—from one week to the next in the course. It also includes the activity structure contained within any topic. For example, in this course, each weekly module included a set of readings, a discussion post due the day before the week’s live class session, a 90-minute live class session, follow-up discussion posts to be completed before the next week began, and a weekly assignment to test attainment of topic-level learning objectives. This structure then repeated weekly.



*Figure 5.15: Structural and temporal disjuncture mapped in an activity system*

During the interviews, students often described their own processes, or the ways in which they approached specific activities. The final tension identified in this study occurred when time disrupted the student processes within or across topics of the course as illustrated in Figure 5.15. This occurred in one of two ways described below.

**Time and availability.** The most obvious tension related to time is that a week contained a finite number of hours and a significant number of deliverables. At the conclusion of any weekly topic, students needed to be simultaneously engaged in the discussion forum, their weekly assignment, and the readings and participation activities for the subsequent week. As Wendell noted “there’s no such thing as doing two things at the same time.” In other words, limited time impeded students’ ability to complete the required tasks that were part of the structure. Six of the nine students (Peyton, Rosemary, Grover, Wendell, Howard, and Amberly) described this tension.

During the interview, Grover was asked to review a discussion post in which he had authored questions and received no responses back. As noted in Tension 2 above, such behavior is a violation of rules of discourse. Grover was asked what it said to him that students did not reply to his question. Recognizing the multiple demands on students in the program, Grover said “it signals to me that maybe everybody thought they had asked enough and moved on to another assignment probably somewhere else.” In other words, lack of time meant that students had to prioritize their activities.

Rosemary talked about how this prioritization first and foremost driven by deadlines in the class. In fact, one of the outcomes of this particular tension was an overemphasis on rules and structure to help students to define their priorities. Three of the students defined the role of discussion—and therefore expected participation

behaviors—based on where it fell in the week. Discussion occurred right after readings and before discussion; therefore, it must have been used as a tool to test student understanding prior to the live session. Given the range of learning goals held by both students and instructors, this was a limitation on student's ability to meet goals.

**Structure of the course.** The way that students approached the entirety of the course—the topic by topic view—can also be seen as existing along a timeline. Students complete the first topic before they move to the second, then to the third, and so on. Additional tensions arose when considering the course structure in this way.

Five students described difficulty in sharing in the discussion forums early in the class, when habits and familiarity had not yet been established. Amberly, Peyton, and Grover described feeling unsure how to discuss their own projects in the discussion forum because their projects were still being defined and were not settled until midway through the semester. Rosemary and Wendell also described feeling that they were still developing a sense of the whole early in the course; they felt it was difficult to take the course week-by-week because it took several weeks of building on the content before they felt comfortable with the material.

Compounding this, three students (Merrill, Starla, and Peyton) described the overlap between the course structure and their own career. These three felt like they may be too novice in their careers to understand the application of materials in a professional context or to consider the big questions that they might face in their work. Merrill, for example, just started her internship between the first and second interview.

## Summary

As described in Table 5.8, five tensions were present in activity systems analysis. Including their related variations, nearly all students described the impact that each tension had on their participation; six of the nine described all five tensions, two described four of the five tensions, and the remaining student described three of the tensions. In many cases, these tensions interrupted student ability to participate effectively in the discussion and to attain both personal and instructor-defined goals.

Table 5.8

### *Summary of Tensions*

<b>Tension</b>	<b>Cases impacted</b>		<b>Cross-case variations</b>
Goal confusion	Wendell Starla Merill Howard Rosemary	Peyton Grover Jaylee	Inability to describe goals Missed goal achievement
Tool impact on discourse	Wendell Starla Merill Howard Rosemary	Grover Jaylee Amberly	Immediacy of reply Threading Seeing the posts of others
Role by comfort	Wendell Starla Merill Howard Rosemary	Peyton Grover Jaylee	Roles attributed to others (leadership is natural) Roles taken by students (emphasis on safety)
Learning from v. with	Wendell Starla Merill Howard Rosemary	Peyton Grover Jaylee Amberly	
Structure and time	Wendell Starla Merill Howard Rosemary	Peyton Grover Amberly	Structure of the course Time and availability

When faced with the systemic tensions, there were two types of response. The first was that students began to perceive the boundaries of the activity system as intractable. Instructions were rules and those rules became impermeable. Such beliefs were often counter-productive and sometimes counter-intuitive. For example, at the conclusion of Peyton's second interview, he identified that while he thought the instructor wanted him to talk about the applications of research practices in his own organization, and while he thought that he would get the most value from doing so, he still kept the discussion centered on the case because he did not think that the group had established this as a habit and the instructor had not established it as a requirement.

In contrast, some students engaged in a different set of behaviors that were aimed at helping them to engage in the discussion in more personally productive ways. These mediation behaviors—which draw on concepts associated with self-directed learning—are described in the next section.

### **Mediation Behaviors**

The first research question of this study asked how individual students make sense of their own goals within an activity system. So far, this chapter has addressed this question, describing in detail how individuals perceived discussion activities and identifying the ways in which tensions within the activity system impacted student approaches to both their course and the individual goals. The second question asked how behaviors associated with Garrison's model for self-directed learning (1997) were leveraged to mediate the relationship between the instructor-designed and student's self-

constructed perceptions of the activity system. This section of this chapter discusses an approach to answering this questions and provides findings from this part of the analysis.

Earlier, a mechanism for defining a comprehensive set of descriptive codes associated with student interviews was explained. These codes were used above to define student descriptions of the activity system. A second round of axial coding was used to link these same codes to the process elements of SDL model: motivating, monitoring, and managing. To align it more closely with the SDLI instrument used in this study, managing was further divided into communication and implementation/planning. Using the definitions of the terms defined during coding, the codes were divided among the four self-directed behaviors as shown in Table 5.9 below.

Table 5.9

*Code Categorization by SDLI*

<b>Motivating</b>	<b>Monitoring</b>	<b>Implementation &amp; Planning</b>	<b>Communication</b>
Course goal	Value	Collaboration	Disagreement
Task goal	Personal feelings	Student process	WeChat
Career goal	Reflection	Focus	Not a discussion
Program goal	Comprehension	Transfer	“Not didactic”
Goal unknown	Openness	Leadership	Mirroring
Case study	Familiarity	Limited time	Time: immediacy
Relevance	Balance	Structure	Challenge
Problem-solving	Comfort	Difference	Noise
Outside examples	Fairness	Roles	Negotiation
Extra-curricular	“New to me”	Efficiency	
Grading	“Got stuck”	Explicit instruction	
	Needs clarity	Rules	
	Pressure		
	Conflict		
	Learning from others		
	Learning about yourself		

These definitions were used instead of simply relying on code co-occurrence because the parent code was not always identified in the transcripts. For example, *comfort* was identified as a child code of *monitoring* during the coding because it dealt with a student recognition of a personal feeling, but was not co-identified with monitoring during initial coding. Some codes—especially those dealing with the environment or content of the program—were not included because they did not fit into any of the four categories.

All participants had been identified for being in the upper or lower quartile of one or more of the four categories in Table 5.9. For any individual who was in the upper or lower quartile for any of the parent categories, all excerpts tagged with the given child codes were reviewed. A brief statement describing the excerpts was authored for each code. Then, trends across these individuals were identified. The aim of this analysis was to identify what types of activity self-directed individuals took within the system. A sample of this analysis is provided in Table 5.10.

One early observation that drove the analysis was that the more self-directed learners might not be aware of these behaviors; however, those who scored lower in any SDLI category were far more aware of the difficulty caused by tensions in the system. For example, three students with high SDLI ratings in Factor 4: Interpersonal Communication were coded as saying “not a discussion” twice; the two students with low SDLI ratings in that factor had the same code applied 14 times. That meant that in many cases, the self-directed mediation behaviors were identified from the absence of dysfunctional behavior, rather than the explicit presence of a functional one.

Table 5.10

*Sample Descriptive Charts for Factor 3: Implementation and Planning*

	High SDLI	Low SDLI
<b>Individuals</b>	2: Grover, Amberly	4: Howard, Peyton, Rosemary, Starla
<b>Most frequent term</b>	Structure (9)	Explicit instruction (40)
<b>Sample terms</b>		
Collaboration	Robust discussion = battling around ideas; inspiration drawn from collaboration	Needs to be controlled to make sure all participate; value in assessing myself based on what I can share
Student process	“Not complicated;” needs disagreement	Following rules to get grades
Time	Too much time in online discussion	Not enough time in live class discussions
Explicit instruction	For details, efficiency	Frustrated by missing details; only posts because of requirement

Eight mediation behaviors were identified, cutting across the four factors of the SDLI. These behaviors represented student attempts to introduce their own goals (self motivation), demonstrate self monitoring and efficacy, and manage the learning environment to meet their own learning needs (implementation and planning, communication). Table 5.11 provides a definition for these mediation behaviors. Each is described in detail below.

### **Mediation 1: Motivation – connecting across levels**

The goal environment for the activity system confused each of the participants in some way. Multiple levels for application and use made it difficult to identify what goals were related to an activity, course, program, or career. One behavior that helped to mediate tensions in the system was to draw connections across levels. Such connections



helped individuals to situate their goals within the course environment. Two specification actions were identified that fit into this category.

Table 5.11

*Mediating Behavior by SDLI Factor*

<b>SDLI factor</b>	<b>Behavior</b>	<b>Description</b>
Motivation	Connecting across levels	Greater reflection on goals Attempts to seek relevance through interest, timeliness, and familiarity
Monitoring	Locating themselves	Internal locus of control Value derived from what they contribute as opposed to what they receive Need for clarity prior to engagement
	Comments on value	Greater awareness and clarity about how value is personally derived
Implementation and Planning	Time	Not enough time or the activity takes too much time
	Identifying border permeability	Fixed nature of instructions vs. guidelines Rules govern task behaviors or social behaviors
	Leveraging difference	Individual difference for structure or leadership differentiation Role of difference in helping to organize group process
Communication	Recognizing the value of disagreement	Role of discussion Value of negotiation
	(not) talking about communication	Counting measures

First, individuals who performed this behavior appeared more likely to reflect on the goals. This was seen in the higher incidence of individuals with low SDLI scores for Factor 1: Motivation suggesting that they did not know what the goal of an activity was, or—in Starla’s case—explicitly stating that she did not “reflect much about why I do this.” Students with high scores may not have been more clear (e.g. Jaylee’s confusion about goal versus takeaway), but the ways that they expressed their confusion provided

evidence that they were putting thought into the question. Howard's statement that "I don't know his goal, but I can tell you what I still remember thinking" is evidence of this type of reflective activity.

A second activity was seeking relevance. This involved attempting to connect activities and case studies to events and experiences that are of greater interest, timeliness, or familiarity. Bringing in outside examples or praising the instructor for sharing examples that were specific to industry were examples of this behavior in action.

### **Mediation 2: Monitoring – locating themselves**

Self-monitoring is about awareness and efficacy. If motivation is about what individuals are putting into the system, then monitoring is about recognition of what they are pulling out. It makes sense, then, that one of the mediation behaviors associated with self-monitoring was student ability to locate themselves in the learning activity. Locating themselves meant that students demonstrated an internal locus of control; they saw themselves as active contributors to the system and they were more aware of how they were perceived by others in the system.

The opposite of this behavior was passivity. Students in the lower range of SDLI scores for Factor 2: Monitoring talked more about what others were doing in the system and the impact that had on their learning. Rosemary's suggestion that the format provides a "motivation to be lazy," or Merrill's suggestion that value is derived from what others say in the forum were examples of external, low-factor score activity.

On the other side, students who engaged in the 'locating themselves' behavior were more likely to derive value from their own actions in the system; Jaylee and Amberly, for example, both said learning from others occurred when they were able to

see how much they were able to say to their peers about what had been posted. In addition, these individuals expressed greater need for clarity of content and instruction prior to posting. All three participants with high-factor SDLI scores had multiple comments about seeking clarity from the instructor to make sure they would be understood in the system; none of the three individuals with low-factor scores made comments about seeking clarity, and they were therefore more likely to ascribe confusion to other students.

### **Mediation 3: Monitoring – recognizing value**

The concept of value has already been briefly noted within the second mediating behavior. Another associated behavior was possessing higher self-awareness of what created value.

Table 5.12

#### *Discussing Value*

<b>Factor Scores</b>	<b>Individual</b>	<b>Value References</b>	<b>Description</b>
High	Jaylee	12	Collaboration/value challenge—this is not a discussion because no disagreement
	Amberly	18	Different student perspectives; value created in what she thinks could be additive for others
	Wendell	2	Depth; value creation when able to take it back to workplace.
Low	Rosemary	8	Everybody needs to be incentivized to share to create value
	Starla	0	
	Merrill	9	Feedback from others helps her recognize value

An important caveat is that this behavior is not meant to suggest that individuals with high-factor scores were more likely to create value; it simply means that they appeared to more frequently describe value as a concept and demonstrated greater understanding of how and when they would perceive value. Table 5.12 illustrates the difference in how frequently high- and low-score individuals referenced *value*.

In all, the comments on value demonstrated greater clarity of thinking and internal control. They were also more prevalent than in those with low scores. Overall, 41.6% of mentions of value came from those with high-scores for this factor, with low score recipients providing 22.1% of all mentions.

#### **Mediation 4: Implementation and planning – appreciating time**

An interesting observation was that both students who possessed high and low factor scores for implementation and planning spoke experienced the tension associated with the temporal dimension. However, there was a clear distinction in how the two groups framed the issue of time. All four students with low tendency for implementation and planning talked about not having enough time to complete the activities. These individuals suggested that activities were too hurried and they needed more time for processing thoughts or participating in the activities.

By contrast, both individuals who had high scores took a much wider, more pragmatic approach to discussing time. Amberly, for example, said that the discussion took too much time. Though this was just another way of saying that she did not have enough time to complete other activities, the framing was distinct because it demonstrated the ways in which Amberly was trying to fit the activity into other planned activities. “Not enough time” to complete the activity would imply passive acceptance

that the activity does not fit in fixed time. The activity “taking too much time” connotes active effort to make the activities fit. This distinction was further evidenced by Grover, who discussed posting two days prior to the due date because he knew that otherwise he would not be able to fit discussion among his other activities.

The difference in these two approaches indicates that some students had a more active appreciation for time, and were therefore more active in time management.

### **Mediation 5: Implementation and planning – identifying boundary permeability**

A second mediating behavior associated with implementation was seeing boundaries as permeable. In their research on self-directed learning behaviors in socio-constructivist learning environments, Sze-yeng and Hussain (2010) described the instructor and other team members as creating boundary objects in the form of instructions, feedback, and other course artifacts. These boundary objects helped guide the students as they took self-regulating approaches to learning the course material. In the current study, the three instructors established boundaries through such activities as creating a discussion prompt and establishing a grading rubric. A difference emerged in that students with a high factor score for implementation and planning were more likely to view these boundaries as permeable, where students with a low score were more likely to see them as fixed and impermeable.

This particular behavior manifested in the interviews in two ways. The first was the student appreciation of the activity’s structure. Amberly and Grover both described the structure as being informative for putting together their posts. Both said that they also looked at discussions in the context of the other weekly activities; in so doing, they were able to develop a deeper understanding of what specific research terms were being

studied. The course structure, therefore, reinforced the specific objective of the activity. Students with low scores, meanwhile, viewed structure as an imposition. It reduced energy and stifled creativity. In addition, Starla said that the broader structure of the course was unclear; in direct contrast to Amberly and Grover's attitude, Starla said the course structure inhibited her ability to understand the objectives of each activity.

The second way this behavior was realized was in the way that individuals spoke about rules. All four of the individuals with low scores talked about activity instructions as rules. Further, three of the four specifically suggested that these rules led to dysfunction because they demotivated (Rosemary), caused role confusion (Wendell), or were not followed by other individuals (Starla). On the other hand, Grover and Amberly talked about rules impacting decorum and discourse. Among the rules identified by Amberly: disagreement and consensus were essential for productive collaboration. This indicated that these individuals were less concerned about how instructions govern behavior. Seeing boundaries as permeable was one mechanism used to manage behaviors in discussion.

### **Mediation 6: Implementation and planning – leveraging difference**

The final behavior related to implementation and planning was leveraging difference. Some students viewed difference as an essential tool for structuring their community and learning from others; others viewed difference as a potential negative factor in their discussions. Students with a higher factor score for implementation and planning were more likely to see difference as a positive force in the discussion.

Both Amberly and Grover said that differentiation of student posts was important because diverse perspectives were helpful for solving problems. Both also had specific

examples of where difference was helpful. Amberly noted that seeing the posts of other students was useful because she wanted to differentiate her posts to make sure that the most ideas were present in the discussion. Grover talked about the difference in student expertise leading to difference in division of labor because individuals were more likely to be seen as leaders in the weeks that covered content in which they had expertise.

Of the four people who had low scores, only Peyton suggested that difference was helpful for student learning. Howard said that he believed difference made the discussion difficult to follow; if students talked about their own experiences in education, publishing, or medical care, he noted, he would have no idea what they were talking about. Rosemary's discussion of difference was focused more on the role of difference in division of labor. Students had different abilities, and these differences carried risk associated with social loafing in groups. In other words, people with high factor scores embraced difference, while individuals with low scores avoided it.

### **Mediation 7: Communication – recognizing the value of disagreement**

Similar to an appreciation for difference, some students had a deeper appreciation for disagreement. In fact, students who possessed high factor scores in Factor 4: Communication were more likely to see disagreement as a requirement for effective discussion.

The three students who scored high on the SDLI for communication said that it was encouraged to disagree in discussion. They were proud of their own level of disagreement (Starla: I say when I disagree; Grover: we're not a bunch of 'yes people'). Two of the three also said that negotiation was important for effective discussion. Amberly talked about negotiation eight times, noting that it is a requirement for healthy

discourse. Starla also emphasized that negotiation may be undertaken on process or leadership structures to make teams function more effectively.

It is important to note that these three individuals did not necessarily see the discussion forums as an effective space for disagreement and negotiation. Amberly said that the points raised in discussion were too similar; therefore she said it was not an effective discussion. The two participants with low factor scores for communication expressed a similar sentiment about the discussion (that it was not effective), but they did not tie these feelings to a lack of debate. In fact, Jaylee explicitly said she did not believe that discussion requires disagreement. Not surprisingly, neither Jaylee nor Howard (the other low score recipient) mentioned negotiation during their interviews.

### **Mediation 8: Communication – (not) talking about communication**

Finally, it was observed that individuals with low scores talked about communication and discussion more frequently than students with high scores. One of the codes in the communication area was “not a discussion,” used when a student made a reference to discussion forums ‘not counting’ as real discussion. Although only two of the nine participants (22.2%) were low factor score individuals, they comprised 78.5% of all mentions of this code. They were also more likely to display evidence of being impacted by the *tool promotion of artificial discourse* tension. The low score individuals comprised 39.7% of all mentions of this tension (or 7 per person). Students with high scores comprised 22.2% (or 3 per person).

This finding is in keeping with a factor expressed earlier: the absence of a particular behavior was often easier to see than its presence. In this case, talking about communication reinforces the belief that discussion is dysfunctional. In elaborating on



her complaints about the discussion, for example, Jaylee said that discussion forums were not a discussion because nobody ever shared their opinion. Jaylee was confronted with the question: if individual sharing would make the discussion more effective, why not do it? It does not happen, she suggested, because the discussion board is not a space to do that. Rather it is busy work. If it is not a good use of time because people are not participating in a meaningful way; they are not participating in a meaningful way because it is not a good use of time. This circular logic is unproductive. Instead, students who do not talk about communication are more likely to high factor scorers.

### Summary

Data analysis revealed five tensions within the activity system that were mediated by eight motivating, monitoring, and managing behaviors. Tensions explained why students struggled introducing, implementing, and learning from their own goals within the social learning context. The mediating behaviors represented student attempts to overcome these tensions. The summary table 5.13 lists the tensions with their related mediating behaviors.

An important consideration is that the mediating behaviors were identified from trends within the interview. It was not necessarily the case that a student who possessed a high propensity for self-monitoring engaged in each of the mediating behaviors associated with self-monitoring. Nor was it necessarily the case that all behaviors were strictly present or absent. For example, in Table 5.12, both Rosemary and Merrill (low factor scorers) used the term *value* more than Wendell (who had a high score). A general trend, however, was that high score individuals accounted for nearly twice as many

mentions of value and operationalized the term differently, with high-factor scorers highlighting the collaborative nature of value. In other words, low-score individuals did recognize value, but their recognition was qualitatively different from those with high scores.

Table 5.13

*Summary of Tension and Related Mediating Behaviors*

<b>Tension</b>	<b>Related Mediating Behaviors</b>
Goal confusion	Connecting across dimensions Locating themselves
Tool promotion of artificial discourse	Talking about communication
Role definition by comfort	Leveraging difference
Learning from versus learning with	Recognizing the value of disagreement Recognizing value
Structural and temporal disjuncture	Appreciating time Identifying boundary permeability

If, however, engaging in certain ways would enable students to mediate between their own goals and the goals set by the instructor, this summary table leads to an important question framed in this study: how can social learning activities be re-envisioned or redesigned to promote student learning? This question will be explored in the discussion in the next chapter of this study.

## Chapter VI

### SYNTHESIS, INTERPRETATION, AND CONCLUSIONS

#### **Introduction**

This study has attempted to explore self-directed learning in the context of social learning environments. Garrison's SDL model (1997) and the SDLI instrument (Cheng et al., 2010) were used to describe self-directed learning as a process that combines self-motivating, self-monitoring, and management (implementation and planning; communication) behaviors. A conceptual model of 'nested' activity systems was used to describe a dualistic approach to discussion activities. Activity systems analysis is the analytical framework used to study Engeström's Cultural Historical Activity Theory, a model that describes mediated actions that define how a learner's goals are actually realized. In this research, the nested model looked at how an instructor's defined design for an activity is considered within the context of a student's individual, self-conceived definition of the same activity. Tensions within and between the nested systems were identified, and self-directed learning was considered as inter-system mediation.

The goal of this design was to answer two research questions: how do individuals make sense of their own goals in the context of the formal, social learning environment? And, how is self-directed learning leveraged in service of these goals?

While most students in the study did have their own incoming goals for learning, they experienced difficulty and discomfort in considering their goal as a part of the social

learner system. The research identified five primary tensions that students encountered in their attempts to make sense of their goals. First, students found it difficult to identify goals at different levels (e.g. program, course, and task). To this end, goal confusion made it difficult for them to associate a personal learning goal or an instructor-defined goal with a discussion activity. Second, the tools used for discussion violated known rules of discourse. As speech acts are used by discussants to advance a goal, these rule violations made it difficult for students to consider their goals in the context of an online, social learning environment. Third, students sought comfort in the discussion context, meaning that they were more likely to select roles that reinforced what they already knew instead of addressing the goals for what they hoped to learn. Fourth, the preferred collaborative practices by students in a formal learning environment was strict division of labor. This meant some students wanted to engage in parallel with other learners, but not necessarily to learn from them. This disconnect made it difficult for all learners to engage their goals in a discussion context. Fifth, the structure of the course made engagement difficult. In some cases, students felt they needed a deeper understanding of how all concepts fit together before they felt comfortable discussing individual concepts in such a visible space. In other cases, students simply said that discussion was just one activity among a number of weekly deadlines and that they did not have time to deeply engage in it.

In making sense of their goals in the context of a social learning environment, these tensions weighed heavily on students' ability to both identify their own goals and recognize them as a component of the online discussion. Put in the concept of the nested model, the tendency for students experiencing these difficulties was for them to dismiss

their individual activity system and rely more heavily on the instructor's defined system. As this move negates a need for self-direction, it was accompanied by student expression that the activity boundaries were fixed (removing a need for self-motivation), that the activity was a unidirectional assignment rather than bi-directional or multi-directional discussion (removing a need for self-monitoring), and that the instructor's instructions should be closely considered as explicit demand (removing a need for self-management).

However, students with a high tendency towards self-direction among any of those three dimensions used a set of mediating behaviors to pull the boundaries of the activity system to a point where their goals could be more actively engaged. Eight distinct behaviors were identified that include connecting across goal levels, locating themselves in the activity goals, avoiding certain ways of talking about of communication, leveraging difference toward student learning, appreciating the value of disagreement, being able to describe how value is derived, appreciating time, and identifying value permeability. These eight self-directed behaviors used in service of the goals helped students to engage their goals in the social learning context.

In this chapter, these findings are reconsidered in three areas. First, they are reviewed in the context of a set of propositions that were introduced during Chapter III and informed the design of the study. Then, they are reviewed in the context of existing scholarship in the field of adult education. As noted in Chapter I, the scope of this study is simply to define a set of hypotheses about the role of self-directed learning in social learning contexts that might be investigated further in additional research; the implications drawn from this combination of existing scholarship and findings from this study are therefore presented as a set of hypotheses that might be investigated in further

study. Finally, Specific implications identified for this study are briefly described, and a comprehensive research program enabled by this study is discussed.

### **Synthesis**

In case study research, theoretical propositions are defined and tested through the collection and analysis of multiple data sources (Yin, 2014). In Chapter III, four propositions related to the two research questions were described. Each of these propositions is discussed below. The four propositions introduced in Chapter III were:

1. Goals for collaboration are initially surfaced by faculty designers and built either implicitly or explicitly into discussion prompts.
2. Goal attainment is mediated through the use of tools, rules of engagement, practices of the community, and division of labor; these can be readily defined through observation and discussion.
3. Students and faculty seek opportunities to align their own goals for collaboration, which may be mediated by the same structural elements.
4. Another activity system design may be necessary for fostering the use and adoption of concepts and constructs initiated as part of individual goal-introduction behaviors.

The first two propositions were foundational to the design of the study and informed the analytical model. Propositions 3 and 4 represented rival propositions. On the one hand, proposition 3 suggested that mediating behaviors can serve to mitigate situations in which the student-defined goals are different from the goals presented by the

faculty designers (as defined in proposition 1). Proposition 4, meanwhile, suggests that new activity designs are necessary for addressing the student-introduced goals. A synthesis of this study is drawn through evidence that supports or contradicts these propositions.

### **Proposition 1**

An assumption embedded in the first proposition is that the faculty designer (Hellen) would set goals for collaboration that could be shared by other faculty and students. A second assumption was that these goals could be embedded—either implicitly or explicitly—in the discussion prompts. The instructor interviews and data from the learning management system (the syllabus and discussion prompts) were intended to assess the veracity of this proposition and the associated assumptions.

Hellen—who served as the faculty designer—was clear in her interview about the goals for discussion. As described in Chapter IV, Hellen believed the primary purpose of social learning activities in the course was get them to think about and apply course concepts. She also believed the purpose was to add new ideas and share experience. This is aligned to both the description of the discussion in the syllabus and the weekly discussion rubric. However, there is a lack of alignment between the description and Hellen’s description of grading criteria during her interview (“whether they post something or not”).

As noted in Chapter IV, each of the instructors for the course had their own goals for student collaboration in the social learning activity. These included both content-focused learning goals (understanding researching) and networking goals (for example, research as a communication tool). All three instructors were in agreement about the

importance of understanding research as a goal for participation. In so far as the content was explicitly a shared component of the course design, there was also therefore a common and explicit set of expectations for participation related to this goal. However, there was disagreement among faculty about the other goals as demonstrated by Tables 4.5 – 4.7 in Chapter IV. This is important because it confirms the complexity of the proposition. Goals for collaboration are initially surfaced by the faculty designer. Some are built explicitly into the design of the activity. Others are defined by the teaching faculty. If not explicitly stated, they may not be shared by all participants in the system.

Perhaps most critically, each of the student participants also held their own student-defined goals, as shown in Table 5.1 in Chapter V. Embedded in the literature presented in Chapter II is an understanding that self-directed learners are “empowered, not controlled” (Bonk et al., 2015, p. 350) and that they possess the ability and motivation “to assume personal and collaborative control” (Garrison, 1997, p. 18) of the learning process. It can therefore be assumed that if the nine learners in this case were indeed self-directed, that they should also have demonstrated effort to surface their goals into the system. An assumption introduced in Chapter I of this study was that given appropriate conditions that support participation and self-direction, students would engage in the types of sharing activity that would surface these goals into the system. Chapter IV described the ways in which the activities were designed to support such activity.

Therefore, three sets of goals must be considered in the activity systems analysis: instructor’s explicit goals, instructor’s tacit goals, and student (tacit or explicit) goals.



**Proposition 2**

All 12 participants (including instructor and student participants) supported the second theoretical proposition, which was informed by Engeström's Cultural Historical Activity Theory and the notion of mediated activity. The participants demonstrated evidence that goal attainment was indeed mediated by tools, rules, community, and division of labor. Further, each described systemic tensions among these elements that impacted their goal attainment.

Prior research introduced in Chapter II demonstrated that a goal of activity systems research was to first corroborate an understanding of the system subjects and objects, and to gain insight into how a set of mediating variables impacting the subjects' perceptions of the activity system in the pursuit of the goals (Lawrence & Lentle-Kennan, 2013; Yeo & Tan, 2014). To that end, an expectation associated with this theoretical proposition was that distinct members of the student population would demonstrate both unique learning goals and unique perceptions of the activity system. It has already been discussed (and demonstrated in Table 5.1) that each individual had a distinct set of learning goals associated with participation in the activity system. Chapter IV identified the connection between an instructor's personal, professional, and academic experiences and their own perceptions of the activity system. The same could be said of students. Grover, for example, held an outcome associated with complex research design based on his prior doctoral research. Wendell, who had prior experience managing an analytics project for a large national chain restaurant was concerned with research as a business process. This is also true for student impressions of the activity system. Starla was more

concerned about the impact of the community and division of labor; Jaylee saw tensions where other students saw none.

In other words, the second proposition was upheld: mediating variables visible through observation and discussion were seen to impact the ways in which individual students pursued the instructor's (explicit and tacit) and student-defined goals.

### **Proposition 3**

The role of these mediating factors was also complicated by students' individual goal introduction. Students did describe having learning goals that aligned with neither their instructor's explicitly shared nor their instructor's unshared goals. Though these goals can be seen as a student's individual learning goals, there was not always an attempt to integrate them into the learning system.

During the interviews, those students who were able to identify why they did not meet their personal goals were asked why this was the case. External rationales indicated perceived tensions within the activity system. Thus, Grover was not able to meet his goals because the structure of the course did not afford him the opportunity to revive his own research (structural and temporal disjuncture). When faced with these systemic tensions that inhibited their experience, learners were more likely to subjugate their own goals at the expense of an instructor's explicit goal.

Chapter II described the concepts of connectedness and embeddedness of subsystems in activity systems analysis. Such concepts help researchers to move beyond a surface analysis to a deeper structural analysis of the activity because they enable researchers to understand, for example, how students perceive an activity system as a series of smaller, linked activities. As noted in Chapter II, this is of importance if a

unique activity system is perceived for the various types of goals. Yet students did not describe an alternate activity system in describing their personal objectives; instead, they described the tensions in the single system that made introduction or attainment of their objectives difficult. In other words, students do seek opportunities to align their goals within the context of a shared, social learning context, but their ability to do so is inhibited by the tensions described in Chapter V.

#### **Proposition 4**

Learners with stronger propensity for self-directed learning exhibited behaviors that helped them to control the learning environment. Neither students nor instructors were immediately able to align their learning goals across the system. If self-direction in a social learning environment is hampered by this fact, then a modified activity system (Proposition 4) would need to support a reduction of the tensions and an increase in the behaviors that support self-motivation, self-monitoring, and self-management.

The veracity of this claim may still require additional research and is explored further in the sections below.

#### **Summary of Propositions**

As it is as yet difficult to ascertain whether these conclusions could be applied across multiple activity systems in different learning environments, the data still supports the following synthesis of the research. Instructors make some goals explicit though may hold other tacit goals for learning. Students may also hold their own goals for learning. In a social learning environment, systemic tensions may lead students to forego their own goals in favor of the instructor's explicit goals. Some students deploy mediating

behaviors that enable them to introduce and support their own learning goals. Social learning activities that support the reduction of tensions and the increase of opportunity for mediating behaviors will more likely encourage student goal introduction, management, and attainment.

### **Implications and Hypotheses**

This study has been explicit in saying that its scope is particular in nature. It is an attempt to apply a new theoretical framework to understand how students within a particular learning context perform a set of acts related to goal introduction and self-directed learning. Though it is not yet possible to draw broader conclusions about the field of adult learning based on this study, several hypotheses about the nature of self-directed learning in a social learning context can be identified and tested to find if they exist in other contexts. These hypotheses are defined from the review of propositions described above. They are borne of expectations for student behavior that were not met through observation or discussion. They are also based on findings already detailed above about the nature of student goal setting in social learning environments. That is, (1) that students did possess a set of personal goals that are unique from their instructor's explicit goals, (2) that self-directed learning is a valuable skill for students entering the professional world and, therefore, that it would be appropriate and beneficial for learners to practice engaging in self-direction in an academic setting, (3) that the social learning context, if appropriately managed would be an ideal space for such practice, (4) that despite these three assertions, students were not able to align their goals with the existing

activity system structure. The five hypotheses described below posit why this might have been the case.

### **Hypothesis 1: Self-directed learning is not inherent**

Whether self-directed learning is an inherent quality of learners has long been an area of discussion in the field of adult learning (Stockdale & Brockett, 2011). The debate stemmed from Knowles' (1970) early description of adult learners as possessing the ability to direct their own learning and be powered by internal motivations. Even as the theory evolved and debate over the nature of self-directed learning continued, Knowles held that his framework was a set of basic assumptions around how adults behave in learning situations (Merriam, 2001). The question of inherency has become especially profound in recent years with new generations of workers entering organizations. The Millennial workforce has been described as driven by self-interest, technology-savvy, and highly-connected (Holt, Marques, & Way, 2012). Though they admitted that not all members of a generation can be grouped according to these categories, it has been suggested that younger workforce generations—both Generation Y and Millennial—possess a greater tendency towards self-direction than previous generations, and that such trends are changing organizational contexts to account for the needs and interests of the growing workforce (Balduc, 2016; Crumpacker & Crumpacker, 2007). As a result, many current advances in pedagogical practice and instructional design—and therefore much of the research designed to assess these practices—are developed based on assumptions of inherency. Faculty and designers create opportunities for active learning that provide opportunities for students to take control of their learning and to encourage reflection on their own understanding (Choi & Anderson, 2016). The concept of adult educator as

facilitator is precipitated by a belief that adult learners have a capacity for self-direction that makes the traditional teacher-student relationship obsolete (O'Halloran & Delaney, 2011).

If these assumptions were true, then creating opportunity for students to democratize a social learning experience would naturally lead students to use discussion as a space for studying their own problems and experiences. In reality, the individuals in this case demonstrated significant discomfort when posed with the opportunity to engage in self-directed behavior, despite the fact that they did possess goals that were unique from the explicit goals introduced by their instructors. The default (natural) movement was to move inward towards the instructor's designed direction. This suggests that even for adult students, behaving in a self-directed fashion in a formal learning environment is an unnatural act. This challenge to the notion of inherency is also established in research, particularly among activity systems researchers, who have suggested that the deterministic view of generational changes is a potentially dangerous oversimplification (Jones & Healing, 2010). In other words, it is the complex, changing environment that leads to behavioral change, not an inherent changing quality of individuals in organizational contexts.

If this were found to hold in other contexts, it would be a significant statement about the nature of self-direction because it implies that self-directed behaviors must be taught and nurtured. Designing opportunities for self-direction may not simply mean creating free space. It may mean providing structure and scaffolding, removing barriers, and increasing opportunities for practicing mediating behaviors.

**Hypothesis 2: Self-directed learning is collaborative**

Students who had their own goals or were self-motivated described being stymied by a number of systemic tensions that were described in Chapter V. These tensions all highlighted the interactive nature of learning. Most of the tensions addressed the way in which students navigated their relationship with the instructor (goal and confusion; structural and temporal disjuncture) and other students (learning from vs. learning with; role definition). Only one (that the tool disrupts rules of authentic discourse) was product of the physical environment in which the discussion takes place, and that tension led to a disruption of student-student interaction. If experienced dysfunction in social interaction can be an impediment to self-directed learning, then functional social interaction must be required for students to be self-directed. Therefore, a related finding about self-directed learning is that it is collaborative in nature. As demonstrated by the participants in this study, self-directed learning in a formal learning environment is negotiated and social.

As discussed in Chapter I, the current program development ecology in higher education has emphasized individualized learning pathways and competency-based learning platforms. Chapter II described research in how students make use of these platforms (Bonk et al., 2015), or else looked at student output as a mechanism for assessing student learning (Horsely et al., 2009; Kim, 2015; Slavit & McDuffie, 2013). But the environments in which those studies took place may lack some of the features and behaviors enacted by students to engage in self-direction. For example, Peyton leveraged the questions of others to assess his own understanding (e.g. when no students asked him for greater detail, he assumed he had demonstrated clear understanding) and used his own comprehension of the posts of others as self-assessment. The social learning

environment served as a space for exercising self-monitoring and for reinforcing learning. It is important that educational systems and instructional design practices consider this and give space for learners to negotiate learning goals with instructors and peers, engage in reflective dialogue, and find opportunities to learn from (and teach) each other.

One important caveat to this implication is that students who scored higher on certain SDLI measures seemed less bothered by the inherent tensions within the system. Students with high-factor scores in communications, for example, were less troubled by the tool's disruption of authentic discourse; students with high self-motivation were less bothered by goal confusion; students with high-factor scores in implementation and planning had less trouble overcoming the structural and temporal issues in the course. It may therefore be important to consider the composition and diversity of groups as a component of activity design. Research on team composition has suggested that well-designed teams account for both the knowledge/skill of participants and the affective/behavioral dimensions (Chi & Chen, 2009; Karakowsky, McBey, & Chuang, 2004). Chi and Chen (2009) described the dynamic nature of team development, and said issues that may emerge as groups work together might be "invisible, un-timed bombs" that could make individual and team performance suffer.

For example, a team composition may be optimal to John, but not to Mary who is unhappy about working with someone inside the team. Equally, a team may be problem free until Mary joins it, as a result of poor relationships between Mary and other team members. These dynamic and implicit issues do not involve direct information and are not presented as predefined criteria before the composition. (9480)

A corollary of this hypothesis is that the social learning space may therefore impede self-directed learning. An implication of this research is that while online discussion may encourage learning of instructor-driven goals, it may do so at the expense



of self-motivation and student-defined goals. Considering the first implication defined here, self-direction may be unnatural for students, and their default behavior appears to be to focus on the explicit instructions of their instructor. The dynamics of an online discussion—and in particular the disruption of authentic discourse that is an inherent problem based on the tools currently used by discussion—may drive learners away from seeing online discussion as a space for dialogue and towards a space for submitting assignments based on instructor goals. In other words, disruption of dialogue leads students to abandon their own goals in favor of instructor goals. This might explain why there was a limited impact on self-direction related to overall performance in the course: the actual impact is felt on the goals that students define, and these are not measured by the instructor. Addressing the tensions that are inherent in online social learning environments can help students mediate towards more successful and personally fulfilling learning outcomes.

**Hypothesis 3: Goals for interaction in a social learning environment are not universal**

An identified research problem that prompted this research was that assessing quality in discussion was difficult because it was impossible to identify the intended or expected outcome of discussion. To remind the reader of the example given in Chapter I, should a student's introduction and discussion of a personal experience be considered productive or unproductive? From the context of an activity systems analysis, the productivity of a discussion would be assessable if a researcher were able to compare the system's object and outcome.

Activity systems researchers have gotten around this particular problem by assuming the teaching goal is the ‘object’ and that student reported outcome is the comparative ‘outcome’ (Lawrence & Lentle-Kennan, 2013; Ryder & Yamagata-Lynch, 2014). This is an entirely logical approach when considering a formal learning environment that is guided by an instructor’s design. If faculty, designers, and researchers are all concerned with the mediated nature of an activity in describing how efforts to achieve a particular object resulted in an outcome, taking teaching goal as object is appropriate. In a social learning context, however, students have the ability to inform the design of the system. Recall also that in this case, surfacing of individual applications and contexts was an explicit instruction often ignored by the students. As noted in the examination of theoretical propositions at the outset of this chapter, learning goals of students were often tacit; while the prompt may have been intended to surface and codify these learning goals (see Chapter IV), it was not sufficient. The following section on design improvements discusses this concern in greater detail.

The findings indicate that there should be greater emphasis on helping students to define learning goals and that these goals must be considered in the design of social learning activities and tools. This is especially true given that not all participants in an activity system have the same sense of the object. Two systemic tensions are relevant to the discussion of this implication: *goal confusion* and *learning from versus learning with*. These tensions suggest both intra- and inter-individual confusion related to the object of a social activity system. Students were not in agreement about the goals of the activity, nor were they in agreement about how they were meant to interact in the system. Critically, the same confusion was expressed by the instructors. Each described a unique set of

objectives for participation across the three weeks, and Hellen differed from Patton and Mel in her overall understanding of the purpose of the discussion activities.

An important limitation to reconsider in light of this hypothesis is the demographic distribution of the sample, two thirds of which was Chinese. Chinese students studying in the United States report language and cultural barriers that might make participation difficult (Li et al., 2017). During her interviews, for example, Rosemary suggested that English as a first language was a prerequisite for leadership in academic project groups—although she also said this was not the case for asynchronous discussion boards. In light of the description of social pressures in the discussions provided by Wendell (who is not Chinese), it may not be surprising that Asian international students—who tend to base their own self image on their relationships with others (Li et al., 2017)—would be reluctant to share personal feelings and stories in class discussions. Indeed, Asian students studying in the United States demonstrate higher levels and rates of social anxiety than their American counterparts (Xie & Leong, 2008).

Still, while Chinese students did account for 67 percent of the sample, that is less than the 74 percent of Chinese students within larger population of analytics management program as described in Chapter III. Chinese students account for nearly one third of the more than 1,000,000 international students currently studying at colleges and universities across the United States (Blumenthal & Lim, 2017). It is also true that while the number of Chinese students studying in the United States who return to China after graduating has increased over the last decade, only 25% of those studying in the United States in 2010 said they planned to return to China (Cheung & Xu, 2015). These statistics suggest that educators do have a responsibility to develop a capacity for cross-cultural

development of the self-directed learning behaviors that are critical for the evolving workplace. In other words, the possibility that the reluctance of the sample to engage self-directedness was based on national origin and not on conditions in the system may in fact bolster the implications and the need for an activity systems orientation to understanding the complexities of the social learning environment in which discussions take place.

That goals for these activities is not universal is important for two reasons. Drawing on the implications associated with self-directed learning that have just been discussed, the first is that goal differentiation does have an impact on student goal attainment. Student outcomes were impacted by the fact that others held a different set of objectives for a given activity, a fact illustrated most prevalently by the *learning from versus learning with tension*. This highlights the need in designing social learning activities for dialogue about shared goals. The second reason this implication is important is that it impacts research methods on social learning environments. The finding validates both the questions raised about assessing quality and the nested activity systems model that appears as the conceptual framework for this study. Future researchers should also consider the impact that individual perceptions of activity system objectives have on their ability to accurately assess outcomes and to define quality of social learning activities.

#### **Hypothesis 4: Goals must be negotiated, explicit, and activity bound**

A number of students' personal identified learning goals that were not met. One of the reasons that students failed to meet these goals is that the instructor was unaware that an alternative goal existed in the system. Instructors believed that students would use the discussion as a space to surface topics and questions that would help them to meet personal learning goals; in most cases, however, this did not materialize. Grover, for

example, had a very concrete goal of wanting to extend his prior research using the research design course as an opportunity to focus on building out his methodology and writing his findings. Though this was not in scope of the defined structure of the course, it is possible that had Grover shared his interests—and considerable prior experience in research design—with the instructor, an alternate assignment could have been created to help him reach his goals. Likewise, several students identified confusion over the instructor's goals for the course, saying they were unclear what they were meant to take away from the learning experience.

Again, it was an assumption of this study (Chapter I) and a defined component of the assignment development context (Chapter IV) that students' individual contexts would be surfaced and their personal learning goals explored. Yet there was not a shared understanding of goals outside of the instructors' explicit goals. This speaks to the fact that goals must be mutually defined within the activity system. If goal creation is negotiated, there is greater chance of students being motivated to achieve learning goals and increased opportunity for students to identify other learners with shared goals or experience.

In many ways, this is aligned to the creation of learning contracts for adult learners. Rooted in self-directed learning theories, learning contracts are documents negotiated between a student and an instructor that helps to define their relationship, outline learning objectives, and defines both learning activities and assessment criteria (Lemieux, 2001). Some have suggested that a limitation of learning contracts is that they are not ideal for learners who require more direction or for contexts in which students are learning content that is entirely new to them (O'Halloran & Delaney, 2011). However,

this research suggests that learning contracts may in fact be more necessary in such situations. This is because in addition to helping to negotiate the activities in which students will engage, learning contracts help to define the rationale and objective for participation in these various activities. Documenting what students expect themselves to learn within a given activity structure can help them to decide how they will approach these activities. If such documentation is defined collaboratively, there is greater opportunity for students to understand their goals and the goals of other participants in the system.

A corollary of the implication that goals must be collaboratively and explicitly defined is that goals must also be mapped to specific activities. The difficulty students experienced in drawing connections between task- and course-level objectives is cited in this implication. As with the prior implication, activity-specific goal definition is validated by the literature on learning contracts.

Standards and best practices for instructional design generally suggest aligning activities and assessments to course-level objectives. Quality Matters—a national research-informed standard for assessing quality in online courses—suggests that aligning stated course objectives to assessment criteria is critical to course quality (Roehrs, Wang, & Kendrick, 2013). An important distinction, however, is that this research suggests that it is not enough to simply demonstrate alignment; rather, specific task-level goals must be defined with an explanation for how they are components of and distinct from course-level goals. This is required for students to understand the nature of each activity's contribution to their learning.

Such definition is also useful in cases where the task-level goal is not specifically aligned to course-level outcomes. This is often the case with the types of process goals that may be associated with online discussion. Student networking, demonstration of collaboration behavior, and ability to evaluate the work of others may be an implicit part of any instructor's goals when developing social learning activities, but they rarely appear as course-level goals and outcomes. Defining goals at the task level can help learners understand the true intent of the instructor, and can help them in their negotiation processes to define the best way to meet their own learning goals for the course and program.

#### **Hypothesis 5: Self-directed learning behaviors may not be observable**

A key question guiding this research was what specific behaviors associated with self-direction are enacted by learners in a social learning context. In an effort to drive connections to other research and to define methodologies for robust quantitative observations of online courses, student mediation behaviors must be observable. Though the mediation behaviors identified in this research inform the ways in which students interact in discussion, they are themselves largely internal and individual in nature.

For example, the *appreciating time* mediation behavior was about a nuanced use of language during the interviews (“not enough time” versus “takes too much time”). There was no noticeable difference among students who used one or the other term to describe the activity structure of the course. In fact, each of the mediation behaviors identified was based on the interviews, and not on the observations of students during the discussions. Table 5.2 demonstrated that there was no recognized difference in student

performance on the course assignments in Research Design. It has not yet been determined if there was difference in language use within the discussions.

As noted in the implications for future research below, additional qualitative and quantitative research on student behavior in discussions is needed to see if there are indeed behavioral differences in the posting behaviors of high- and low-score individuals, the behaviors that have been identified to date are not observable in practice. This raises a question of whether self-directed learning is an internal, cognitive practice, and therefore whether it can actually be observed by researchers.

### **Conclusions: Towards Conditions Needed for SDL**

The findings from this research answer questions about how a set of learners engaged in motivation, monitoring, and management as self-directed behaviors to introduce to their own goals in a social learning context. While the research was particularized to a specific context, the findings provided insight into broader questions about the nature of self-directed learning in social learning contexts. The implications listed in Table 6.1 describe five hypotheses borne of this study.

Table 6.1

*Summary of implications and hypotheses*

Hypothesis 1: Self-directed learning is not inherent
Hypothesis 2: Self-directed learning is collaborative
Hypothesis 3: Goals for interaction in a social learning environment are not universal
Hypothesis 4: Goals must be negotiated, explicit, and activity-bound
Hypothesis 5: Self-directed learning behaviors may not be observable



One way to consider these implications is as potential conditions required for self-directed learning. They describe the ways in which faculty and instructional designers must think about their learners in order to develop activities that take into account student- and instructor-specific goals.

### **Recommendations: Improving the Research Design Course**

Students in the Research Design course described systemic tensions that provided a deterrent to individual goal introduction. The participants either defaulted away from self-direction or else they demonstrated mediating behaviors to overcome these tensions. Yet it has also been suggested that self-directed learning is a beneficial—if not necessary—skill for adults in a professional context (Smith, Sadler-Smith, Robertson, & Wakefield, 2007). Therefore, if faculty or designers were interested in promoting self-directed learning through the social learning space, course redesign should be aimed at doing one of two things: either decreasing the impact of systemic tensions or else increasing the opportunity for students to exercise mediating behaviors. A brief discussion of these design implications is described below, and a more comprehensive set of specifications is described in Appendix F.

### **Redesigning Learning Activities**

As described Chapter IV, this study took place in a course environment using common instructional design practices and run on a market-leading learning management system. Yet the findings of this study indicate that both the functionality of the tool and the manner in which students were asked to interact in the system may have caused

tensions. To that end, this section of the study is dedicated to the reimagining of activity and tool design.

**Encouraging reflection.** Goal confusion is addressed through efforts to connect across the various dimensions of goal (professional-program-course-task) and through attempts by learners to locate themselves within the activity. To reduce the impact of this tension and increase mediation towards personal goals, instructional activities must promote reflective behaviors.

In the Research Design course, students were asked to respond to a set of prompt questions about a case study. After the live session, they were asked to continue the discussion of the case and—eventually—to draw parallels between their answers and their own professional experience. Despite this request, however, students described difficulty in connecting the findings about a case organization to their own organizational context. This may be because they failed first to connect the question or the case context to their own experience. More often than not, students interviewed described a primary goal of understanding course content, with professional application to a case as secondary. Such an approach could be seen as an instrumental approach (Drago-Severson, 2009) in which students' primary concern was the correct identification and use of course concepts.

Reflecting on the prompt and case question and their connection to a students' own context and personal learning goals can help students to locate themselves within the case. Doing this prior to and while students are responding—rather than at the conclusion of the activity—might mean that students are more likely to focus on the connections between the question and their own context, rather than trying to draw connections

between what they perceived as a correct or incorrect answers to the case questions and their own professional context.

**Attending to whole-course design.** Recall in Chapter IV that there was discussion of the design process emphasizing narrative structure. The prevailing metaphor for course design is a narrative arc, with courses—and lessons within those courses—being designed to tell the story of the content. Such a model assumes that a course has a defined beginning, middle, and end. It assumes that the sum of these conceptual introductions is equal to a full course experience. These assumptions are problematic for two reasons. On the one hand, they reinforce the fixed nature of the learning experience. Narratives are fixed structures (Tyler & Swartz, 2012) and may therefore be perceived as impermeable; if students do not wish to disrupt the narrative flow, then goal introduction is to be avoided. At the same time, narratives are problematic because students expressed that they wanted to be able to see—and reflect on—the whole before they being introduced to its component parts.

An approach that emphasizes the whole prior to exploring its component parts may be a solution to address this concern. This can be framed as the distinction between inductive and deductive reasoning. Induction—starting with the small pieces to build the whole—can be replaced by deduction, where the broader perspectives are introduced and subsequently analyzed from the perspective of the smaller components. Consider Grover, who was upset to learn at the conclusion of the final course of the program that his personal goal of extending his dissertation research was not going to be realized. If he had understood the whole curriculum before he took any class, this frustration might have been avoided. A precedent for such narratives already exists in the form of systems-based

approaches. These approaches have emphasized breaking down disciplinary borders and units of analysis. World-systems analysis, for example, suggested looking not at specific nation states as an analytical unit, but at the dynamical forces that “cut across many political and cultural units” (Wallerstein, 2004, p. 17). New narrative structures that are based on a systems orientation might be a solution to the temporal-structural disjuncture.

**Attending to ‘seat hours.’** A third improvement is simply to be more mindful of the amount of time required for discussion. In Research Design, discussions counted for 25 percent of the final grade in the course. By contrast, students’ weekly individual assignments comprised 35 percent of the final grade. Some students described prioritizing their other work over engagement in the discussion and said that the multiple weekly deadlines were overwhelming. A solution may be to reduce the amount of work that students have. This would clear student time to participate in the discussion, but it would also increase the relative weight of each discussion activity.

**Role definition.** Students may benefit from more clarity around the roles that students are expected to play in the system. Student perception of their own role in discussion impacted behavior in two ways. First, students tended to assign roles based on incoming comfort. Consequently, a second tension was that students deferred to more expert leaders with little room for disagreement in their discussion. A key question that emerged from this area of study is whether the questions posed in the discussion forum were intended to be the object of the activity system, or if they were simply guidelines to help students in the process of achieving a goal. If—as suggested in the introduction of this study—discussions are designed to be spaces where students can engage in dialogue

about concepts in the course and introduce their own learning goals in a social learning system, then a question in a prompt should be viewed as a means to an end rather than an end in of itself. However, this is not how students described their understanding of the goals of these activities nor is it how they described their behaviors during these activities. Two design interventions that might address this tension are clarifying the object for students and assigning specific roles that encourage disagreement.

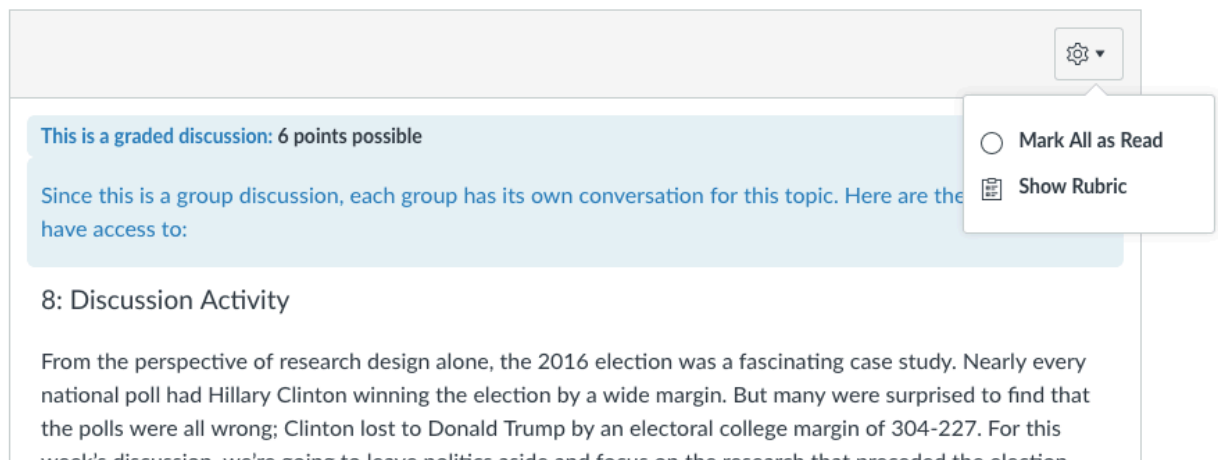
*Clarifying the object.* One observation made by students was that discussion forums were not as productive as group projects with respect to their ability to foster interaction. This may be because in group projects, students are more aware of the production aspect, while the focus of discussion is more on answering questions. Discourse is not commonly seen as a ‘product.’ Student awareness of productive discussion as a focal objective of the forum activity might influence behavior, particularly if the grading rubric was reflective of this aim. The following assessment criteria are currently described for evaluating discussion:

Your discussions in this class will be evaluated based on your contributions to the discourse, your use of course concepts, and your ability to apply your understanding of research design principles to practice examples identified by the initial prompt or raised within the class community.

Though the instructors agreed that each criterion would be awarded two points (for a total of six points), it was also true that the rubric in Canvas discussions are not immediately visible to students; instead, they needed to click an icon in the upper right corner of their screen and select “show rubric” from a drop down menu as seen in Figure 6.1. In other words, the paragraph above was the only directly visible assessment criteria for students. This paragraph promoted the importance of students’ individual contributions, their

understanding of concepts, and their understanding of principles. This conforms with student description of the activity as an individual assignment, wherein they received full credit for participation.

A two-part approach to addressing this problem would be defining new grading criteria that highlight the collaborative, production goals of the activity and making the rubric for these criteria more visible. Though additional research would be needed to fully define the range of productive behaviors, there is some indication from this research that behaviors such as constructive disagreement, attempts to divide labor or draw conclusions, demonstrated appreciation for the context of other students, and posing thoughtful questions may encourage students to view the discussion forum as a more productive space. Note that these are behaviors that demonstrate collaboration needed to enable self-direction; they are not behaviors that are demonstrative of self-direction itself. As noted in the hypotheses above, such behaviors may not be observable.



*Figure 6.1: Visibility of discussion rubric*

Another approach could be to limit the number of questions posed in the discussion. The prompt in module 8, for example, includes at least eight questions. The

volume of boundary objects may make the discussion appear impermeable because students are concerned about their ability to fully meet the instructor's demands. Across all cases, introducing a personal context is the final question posed, meaning students may have exhausted their required posts before they reach that question. Fewer questions with greater emphasis on the type of environment or discussion that students are meant to create might actually be more productive; by decreasing the number of questions, goals and objectives can be emphasized over discrete subject matter, and the emphasis can be replaced on objectives.

*Assigning roles.* Finally, one mechanism that might be considered as a design intervention is assigning specific roles for participation in discussion. Though some students described a leader position (often the first person to post each week), the prevailing sentiment was that most students took up the same role in discussion: to answer the instructor's questions. This created a difficult situation because the initial turn for each student was occupied responding to somebody who was not actually a participating member of the group (the instructor) and—as a matter of design—failing to respond to one another. Each week began with this stagnant series of responses that did little to advance the conversation.

One way to avoid this in future discussions would be to limit the number of people who provide initial responses to the instructor. This would increase the number of people who could be assigned alternative roles. Such roles might include a dissenter who intentionally seeks out different opinions and a convener who is responsible for reporting on the findings and drawing conclusions on discussion. Appendix F includes an example of a case in which such roles were used.

**Redesigning discussion tools.** As discussed in Chapter IV, one of the aims of the 2014 research that informed this study (Baker Stein et al., 2014) was to determine whether student interaction in discussion forums called for the redesign of discussion tools. Major learning management systems deploy discussion forum tools with similar feature sets, including threaded discussions, rich text editor capabilities, and email notifications. This research suggests that some specific features in development may help promote productive discussion and encourage students to engage in self-directed behaviors. These include targeted notification, multimodality, and visual mapping of discussions.

One of the powerful features of Canvas is the ability of students to select how they receive their notifications—including different media (e.g. email, phone, Facebook or Twitter notifications) and timelines (immediately, daily or weekly digests) for each type of notification. However, the only possible notifications within discussions are to be notified of new discussion topics and to be notified of new posts in the topic. This does not present the degree of granularity necessary for students. Notifications that identify direct replies to student or else that use student profile data to select posts that might be of interest to students might help students to focus their attention and reduce systemic tensions. A more thorough explanation is provided in Appendix F.

The ability to move back and forth between modalities might also be preferential to the current ‘locked’ nature of discussion tools. Basic multimedia features (video, rich text editor) are already enabled in discussion. What is not currently present in the forum tool is the ability for students to modulate between live and asynchronous communication, nor is it possible to easily collaborate on a common product. It is



interesting to note that many of these features are already independently embedded in the Canvas learning management system. Yet Canvas does not currently allow students to move between these media within the same forum. Enabling the set of features to co-exist could transform the collaborative nature of discussions.

Finally, visual mapping as exemplified by Figure 6.2 may serve as an organizational mechanism for approaching discussions that are inherently non-linear and fluid. Visual mapping might allow students to track discussions back to an initial prompt; if students wanted to join a conversation already in progress, this would allow them to simply review what had already been discussed so that discussions would not be stuck in place reviewing the same concepts on repeat each time a new member joins. It might also allow a less complex mechanism for reviewing where new discussions have been added. This could reduce the sense that discussions are artificial and reduce the difficulty associated with time and structural disjuncture.

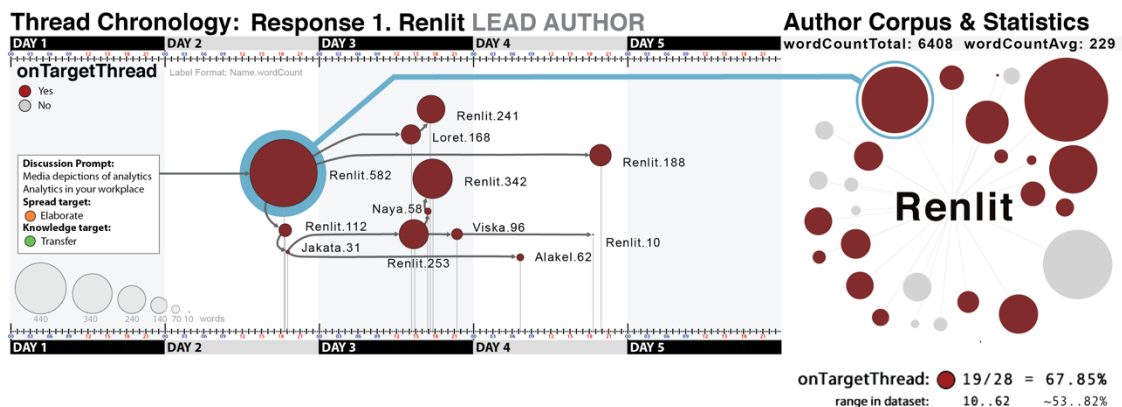


Figure 6.2: Sample visualized discussion (Baker Stein et al., 2014, p. 96)

An important caveat for this feature set is that Canvas currently only enables students to see the posts of other students in their discussion groups. In order for this to have maximum effect, students would need to be able to see across and contribute to

other discussion groups. It may even be the case that discussion groups are not fixed and could be merged, discarded, or extended as instructors and participants see fit.

### **Summary**

This discussion has extended the implications for student goal identification and self-directed learning behaviors by defining several interventions that might improve the ability of students to act in self-directed ways within the social learning context of the Research Design course. While these recommendations for design are drawn from the findings of this study, more research is required to identify whether they would hold across other contexts. The remainder of this discussion is dedicated to reviewing further research efforts.

### **Discussion**

To this point, the findings, hypotheses, and recommendations that have been borne of this study are highly contextualized to the specific course in which this research has taken place. Further research will be needed to identify which of these findings is universal and which is bound by the context of this study. The rationale for completing the study using activity systems analysis was—in part—to define the role that context played in student goal generation and discussion behavior. It therefore makes sense that an outcome of the study should be heightened awareness of contextual factors. It is reasonable to ask, for example, how behaviors might have been different in a cohort that contained more executive students. Though the sample was demographically reflective of

the program's population, might the study have been different had the discussions had fewer international students, or fewer students with no prior professional experience?

The criticality of context to the outcomes of this research calls into question some of the broader questions and operationalization of terms used in this study. Self-directed learning has been used in contrast to regulation to mean that individuals are not only selecting pathways, but engaging in the definition and construction of learning events and environments. Such self-direction can have an impact on the social learning space in two ways. First, as seen in prior research (Baker Stein et al., 2014), individual acts can influence what is discussed in the learning environment. Secondly, however, the introduction of topics, narratives, and constructs may have the ability to transform how others make meaning of their own experiences. Kolb (1984) identified dialects for grasping and dialects for transforming experience. This impact on learning and meaning making explains why goal introduction may impact the productivity of a discussion for all participants, but it also explains why this productivity is so difficult to capture.

It is still true, however, that the diversity of those involved in discussion may render such definitions of productivity unusable. Some students may not be at a level of development that enables them to leverage the meaning-making scheme of others for exploring their own context. Other students may not have the appropriate context from which to create meaning. Still other students may engage in learning activities for an entirely different motivation, such as to obtain a degree, gain privileges for working in the United States, or to learn a set of pre-defined skills. There is therefore a need to revisit the ways in which self-directed learning, productive discussion, and the

relationship between these two constructs have been discussed in this study. A brief discussion of these three areas follows.

### **Self-Directed Learning**

One factor that enabled this research may also serve as one of its more humbling limitations. In designing the study, an attempt was made to keep the contexts as similar as possible in order to isolate the impact that engagement in a social learning activity had on student learning and expression of outcomes. This was achievable given an institutional mandate—and a design methodology described in Chapter IV—that required all sections of the same course needed to be consistent with respect to learning outcome, assessment, and instructional resources. In other words, despite the fact that there was a wide diversity of learner as concerns their personal, professional, and academic background, all students in the program needed to take an identical research design course.

Such a model is driven by necessity and by the culture of higher education. Academic governance from within and outside of the school in which this research took place require that students demonstrate similar outcomes and take similar courses. These requirements are driven by the state education department and regional accreditors who require notification and approval to changes made to or iterations drawn from a degree program's design. Even modern innovations in higher education, such as seen in competency-based education, are organized around a defined, standardized set of skills and behaviors that must be demonstrated in order to demonstrate mastery. Those promoting the model have suggested that “in the future, expertise rather than experience underlie competency-based practice” (Aggarwal & Darzi, 2006). While individual students may indeed have greater flexibility in sequencing or pacing, they do not have the

ability to introduce their own learning goals nor can they fundamentally restructure the learning space. Similarly, it is possible that students within the formal learning environment that comprised their experience in the Research Design course may have felt that the consistency with which they needed to demonstrate learning objectives limited their time and ability to be self-directed as defined in this study. This can be seen clearly in the actions of Grover, who completed a course he did not need at the expense of engaging in research activities that could have benefited him.

It is also the case that individuals may not see the same need for self-direction. Professions that are more rules-based—such as medicine or engineering—are rooted in the importance of competencies for ensuring success or keeping people alive. As many of the students in the program in this study came from computer science or mathematics backgrounds, it is possible that they simply saw no professional need for self-direction. Personal goals after graduation likewise need to be considered: a student who requires a degree as a matter of professional necessity or in order to gain entry into the United States workforce would implicitly be less likely to deviate from the minimum requirements as stated by the instructor.

A corollary to this is a question of whether adult learners who forego participation in self-directed activities could themselves be seen as expressing self-direction. This research has suggested that those who did not engage in mediating behaviors were less self-directed, yet it might be the case that these students were simply expressing self-direction by rejecting the instructions related to sharing personal experience. While this is a possibility, it is important to remember that the mediating behaviors were drawn from

trends associated with high SDLI scores and are therefore correlated with a tendency toward self-direction.

All of this suggests that the factors influencing the expression of self-directed learning extend beyond the structure of the learning activity. They are embedded in the contexts that comprise formal higher education. They are also culturally-bound, both from the perspective of national culture and professional culture. Students for whom self-directed learning is not a necessity may not engage in the practice, and individual perceptions of what comprises self-direction may likewise influence how it is expressed.

### **Productive Discussion**

This study gave particular attention to the individual goals that were presented by students in the discussion. It has already been discussed, however, that the development and inclusion of such goals cannot be divorced from learner context. Absent from this study was a discussion of collaboratively-defined goals. With respect to assessing the productivity of online discussion, attainment of shared goals may be another distinct marker of activity success. Chapter II presented a potential gap in Garrison's Community of Inquiry framework, noting that some have suggested learner presence as a necessity for productive discussion (Shea et al., 2011). As noted, Garrison rejected this assertion, and suggested that the instructive activities being sought—such as collaborative goal setting and division of labor—are a part of teaching presence, and that it is the misconception of critics that teaching behaviors must be carried out by teachers (Garrison, 2017).

Interestingly, students in this study claimed that student-driven teaching presence was indeed lacking in the course (*tension: learning from versus learning with*), but

blamed this lack of presence on the activity design rather than on an internal or collaborative quality of the group. This raises further questions about the nature of student engagement in online discussion forums. If student-as-teacher is a requirement for productive discussion, why would students fail to exhibit this skill, especially when they know it makes engagement more effective? This may be related to the recurrent response that online discussion is an individual activity, and not a group activity.

Research does suggest that students in online courses tend to exhibit less connectedness than those in face-to-face classes (Blankenship & Gibson, 2015). It is not clear from this research if there is a causal relationship present in this argument: does the failure of students to exhibit teaching presence lead to a lack of connectedness around shared goals? Or does the lack of connectedness cause students to disengage from teaching behaviors?

### **Self-Directed Learning in Productive Discussion**

The answer to the questions above may require a radical shift in how online discussion activities are defined and designed. If productive discussion is to be defined as the confluence of productivity related to instructor-defined, student-defined, and community-defined goals—as appropriate—then an effective discussion must engage learners in meaning-making, reflection-in-action, and teaching presence. As noted above, however, context—both internal and external to a given activity—shape and transform the manner in which participants engage and the role that individual goals have on the discussion. Therefore, while different contexts may require different types of discussion activities, it is possible that the need for self-direction—and therefore the design of any

activity—may need to be flexible from student to student, and not just from course to course or content area to content area.

The recommendation section in this chapter suggests alternative approaches to discussion that highlight student context-raising and collaborative production. To some extent, there may be questions about whether the activities and designed proposed would still constitute an online discussion forum. Yet in order for online discussion to meet the needs described in this section, it may be necessary to reframe discussion from a single activity to an ecology of activity types. Discussion-based activities that include collaborative projects, synchronous and asynchronous communication, and opportunities for reflective dialogue have the best opportunity for surfacing teaching presence and cognitive presence and transforming the productivity of social learning spaces.

### **Implications for Future Research**

This study is a small-sample case study designed to address particularizing questions. As described in Chapter I, there was a recognition that the outcome of this study would be a set of hypotheses about student behaviors that would require testing in other environments. Future research should be aimed at testing the findings and hypotheses across multiple audiences and environments to see which can be redefined as conclusions. It is the hope of this researcher that this study is the beginning of a larger research program that will eventually lead to deeper understanding of self-directed learning within social learning contexts. What follows are ideas for several studies that might validate and extend the research presented herein.



## **Multiple Learning Environments**

Findings identified above are appropriate for the Research Design course studied. The demographic mix of this study may cause some to question the validity of its claims. For example, six of the nine student participants in the study were Chinese, which carries both cultural and language implications. Might students have been less likely to introduce their own goals because they were nervous about being misinterpreted or because they come from a culture that shows greater deference to their teacher's authority? In the study, there was no correlation seen between student nationality and their SDLI scores, between student nationality and their reported goals, or between student nationality and their class grades. Other studies have suggested that Chinese students may already have training to be more self-disciplined and self-regulatory so as to make them effective at driving their own learning (Bin Yuan, Williams, Fang, & Pang, 2012).

Still, to draw the conclusion that the outcomes of this research are generalizable and that, therefore, these implications would also apply to other contexts, the study must be replicated in multiple learning environments. This research would serve two important functions. First, multi-case analysis would validate the findings of this research. Secondly, such research may identify additional tensions within the social learning environment.

**Validating the findings.** To isolate the impact of student behaviors, every effort was made in this study to create environments that were as consistent as was possible to achieve. Even while recognizing that specific instructor behavior created some variance across the sections, there was enough that was consistent—including the tools used for discussion, the prompts for discussion, and all course content—that there may be

questions of whether this research would be generalizable in another context. A study that samples students across multiple courses within multiple programs should be undertaken to validate the findings. The design of this research would work well in such a research design. Because the analytical framework for this study uses the designed course experience as the interior triangle, the dependent variable (what are the behaviors that mediate between a designed and student-constructed learning activity) would be the same regardless of how the context is changed.

**Validating tensions.** A multi-environment analysis would also help the researcher to identify whether the identified tensions are universal to discussion activity systems or if they are isolated to this particular context. At present, they are being treated as particularized. However, many of the things expressed by students seem resonant in other contexts as well. Canvas discussion forum features, for example, would exist in any course site that uses Canvas. Likewise, any discussion activity system would have specific task-, course-, and program-level goals. It is reasonable to ask whether these are applicable in multiple settings. Additional research could answer this question.

### **Relationships to Learner Behaviors**

As noted in Chapter I, there was an early attempt to identify a specific behavior present among highly self-directed individuals. When tested, this behavior was not observed. Anecdotally, much of the posting behavior between those identified as high-SDLI and low-SDLI was similar. What was decidedly different was their internalized thoughts and reactions to the discussions. That said, there was no explicit attempt in this

study to link self-direction to behavior. Such linkages would be valuable for both qualitative and quantitative observation and in studies of causality.

**Additional qualitative studies.** One of the promises of activity systems analysis is the ability to develop analytical models for studying complex, embedded activity systems. Figure 2.1 in Chapter II posited one such system: goal development as an independent activity system whose outcome feeds into the object of another activity system. A study similar to the present research could be undertaken to understand the conditions under which individuals set their own goals. As stated in Chapter II, it is an aim of this research that discussion be treated as a reciprocal—and not static—learning exchange. While this research has reviewed the impact that student goals have on the activity system, they have not examined the impact that the conditions of a discussion have on the expression of a student goal. This would be important for more deeply understanding how students can be encouraged to define and articulate personal learning goals. Because metacognition and awareness are central to self-motivation (Pilling-Cormick & Garrison, 2007), this is essential to promote learner self-direction.

Such research might also help explore in more specific detail how one student's participation impacts another student's learning. This research initially sought to address this topic by identifying how new concepts or constructs introduced by one student are subsequently utilized by another. As described in Chapter I, it became clear early in the process that the data was not sufficient to address these questions. Research that explored student goal transformation over time might help provide insight into how the activity system impacts student learning, and how continued interaction with the system impacts the evolution of student goal setting behavior.

In addition, this research could be enhanced by providing students with greater opportunity to reflect on their participation. The researcher did review student activity and identify specific areas to ask about during student interviews, but having students from a particular group review, dissect, and interpret the actions of group members through reflective dialogue may be an interesting exercise. This could result in understanding of phenomena that were confusing to some members of the community but not to the researcher, or might highlight additional areas of tension or agreement within the community.

**Enabling quantitative observation.** There is existing precedence for studies that examine behaviors in online discussion (Baker Stein et al., 2014; Skifstad & Pugh, 2014). The question to be addressed by these studies is whether self-direction is associated with specific behaviors. Such a study would require a large enough sample to draw conclusions about the population, especially given that students might demonstrate high-factor scores in some areas but low-factor scores in other areas (e.g. high self-motivation but low self-monitoring).

Quantitative observations can be used to more deeply understand the types of interactions that are present in the activity system. Quantitative observations serve as a useful mechanism for exploring patterns of behavior that can help researchers explore complex and dynamic interactions in learning environments (Campbell, 2017). Such methods could be used, for example, to define the number of students who engage in challenge or disagreement behaviors or the relationship between years of experience and introduction of personal stories. Such patterns would shed light on whether there is indeed a correlation between SDLI factor scores and student behaviors. This would

further explore questions identified in the implications section above about the observed and dialogical nature of self directed learning.

**Studies of causality.** Ultimately, the purpose of completing such studies would be to complete research that could address multiple questions of causality. That is: does exercising the behavior cause self-direction? Or does self-direction lead to the exercising of particular behaviors? Put another way: can we engage students in behaviors that would increase their capacity for self-direction?

It is this type of research that is at the heart of the implications identified at the opening of this chapter. It would identify definitively if self-direction is a learned behavior or an inherent quality. To engage in this study, discussion groups would need to be created that were equal in composition. Then, students in some groups could be given specific instructions about how to behave. These behaviors may be drawn from the discussion above, and could include encouraging reflection, assigning roles, or changing the prompts to promote self-direction. Studying how behaviors evolve and retesting students on the SDLI would provide an indication of change over time.

In addition to this research, an interesting question emerges about how learners develop the capacity for exercising these behaviors. Can they learn them from each other in discussion? Groups that are mixed with high- and low-score individuals could be looked at over time to see if the behaviors of highly self-directed individuals impact the behavior of other students. This has implications for the design of discussion groups and a general understanding of how self-direction occurs in social learning contexts.

## **Impact Studies**

Finally, a rationale for this research was to design new systems that promote student learning, whether that be their own goals or those defined by an instructor. Completing the research identified within this discussion would help the researcher to develop studies that analyze the impact of student behavior on their learning.

One branch of research would assess observed self-directed behaviors against student learning outcomes. To assess for student attainment of designed learning objectives, student behaviors could be measured against rubrics and assignment scores. While the current research did find that there was no significant difference between student scores on assignments or overall grade based on their SDLI scores, it is important to recognize that the SDLI measured propensity for self-direction, and not any measure of the actual exercise of self-directed behaviors. If such behaviors were identified through quantitative observation as noted above, then exercise of self-direction could be explicitly tied to student performance on assignments.

It would also be possible to assess students against learning objectives of their own design. If there is clarity of student-introduced goals (primarily achieved through dialogical reflection as noted in the discussion above), student performance against the objective can be measured against the tendency of students to behave in self-directed ways. In doing so, the most effective self-directed behaviors can be identified for future study.

The last piece of learning research that would be a useful component of a comprehensive research project is a longitudinal study examining the impact of exercising self-directed behaviors on developing the capacity for self-direction in life

outside of the class environment. Such research could follow up with participants after they have completed their coursework to find out if changes in discussion behaviors have translated into transformation of behaviors in a professional context. It would be the hope of this researcher that if it is proven that self-directed behaviors can be taught, such a longitudinal study would find that exercises self-directed behavior is a learned skill that can be used in multiple contexts, both inside and out of the classroom.

### **Conclusion**

As online education becomes increasingly prevalent, new models for the design of learning experiences have evolved. These experiences have attempted to attend to both the self-directed and social learning needs of adult learners. Yet models that effectively integrate these two fields of study have been largely absent from research and practice.

This study is the first phase of what hopefully becomes a robust research program designed to examine the intersection of self-direction and social learning environments. Using activity systems analysis the researcher studied how students conceive of their own goals for learning within a defined discussion systems. Several systemic tensions were identified that made it difficult for students to introduce their personal learning goals. Finally, mediating behaviors that enable self-direction were defined.

The research revealed key features of self-directed learning and discussion with broad implications for future practice and research. In establishing these implications, the study presents suggestions for the design of social learning activities and the discussion tools used for online discussion forums. Such improved designs can have a positive impact on learning by reducing the effect of systemic tensions and increasing the ability

of learners to practice mediating behaviors. If future research validates that these improvements increase student goal introduction, new models for assessing the quality of discussions can be defined that account for the democratic value of social learning spaces for adult learners.



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## Appendix A

### Informed Consent Protocols

**Protocol Title:** Goal Introduction in Discussion Activities (Discussion and Survey)

**Principal Investigator:** Brian Dashew  
518-598-4703, bd2340@tc.columbia.edu

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#### **INTRODUCTION**

You are being invited to participate in this research study called “Goal Introduction in Online Discussion Activities” You may qualify to take part in this research study because you are an adult learner enrolled in and participating in discussion activities in APANPS5300: Research Design. As part of your course, you will be required to participate in weekly *Discussion Forum Activities*. At certain intervals in this course (during modules 3, 8, and 11), the content of your discussion will be analyzed by a researcher. You will also be asked to participate in a survey activity during these same weeks of the course.

#### **WHY IS THIS STUDY BEING DONE?**

This study is being done to determine the conditions under which students introduce and explore their own goals for learning in online discussion. In particular, the researcher will be performing a content analysis of the aggregated contents of the weekly discussion during modules 3, 8, and 11.

#### **WHAT WILL I BE ASKED TO DO IF I AGREE TO TAKE PART IN THIS STUDY?**

For this part of the study, you will only be asked to engage in your regular, required class activities. This includes your weekly Discussion Forum Activities. As described in the course syllabus:

You will actively participate in online discussions on the weekly course topics, requiring you to bring in current information, analyze content and draw conclusions from that data. Initial posts will be based on your application of the course readings to cases, your own professional experience, or your final research proposal. You will continue to post throughout the week, working together as defined in the weekly discussion prompt.

Discussions are very important because they allow you to create a community of shared inquiry and understanding. They are also a space for you to introduce your own experiences, questions, and insights into the class discourse. To that end, it is important that you engage actively and thoughtfully in all class discussions. Early in the semester, I will provide additional information to help you get the most out of your online discussion experience.

Your participation in these discussions is not optional. However, if you do not want your data included as part of the study, you may indicate this by opting out below.

In addition to discussions, you will also be asked to complete three surveys during weeks 3, 8, and 11. These surveys include a standard, validated instrument for analyzing degrees of self-direction. This survey should take approximately 20 minutes to complete.

**WHAT POSSIBLE RISKS OR DISCOMFORTS CAN I EXPECT FROM TAKING PART IN THIS STUDY?**

This is a minimal risk study, which means the harms or discomforts that you may experience are not greater than you would ordinarily encounter in daily life while taking routine physical or psychological examinations or tests. The principal investigator is taking precautions to keep your information confidential and prevent anyone from discovering or guessing your identity, such as using a pseudonym instead of your name and keeping all information on a password protected computer and locked in a file drawer. If you do not opt out, the anonymized contents of your discussion may be used as part of this and future studies.

**WHAT POSSIBLE BENEFITS CAN I EXPECT FROM TAKING PART IN THIS STUDY?**

There is no direct, immediate benefit to you for participating in this study. However, this study will inform the way in which collaborative activities are designed and facilitated in the future; it is possible that other students taking APANPS5300 will therefore benefit from your participation. In addition, some lessons learned may be leveraged in future semesters of your own course of study.

**WILL I BE PAID FOR BEING IN THIS STUDY?**

You will not be paid to participate.

**WHEN IS THE STUDY OVER? CAN I LEAVE THE STUDY BEFORE IT ENDS?**

The study is over at the conclusion of the semester. However, only modules 3, 8, and 11 will be the subject of study.

**PROTECTION OF YOUR CONFIDENTIALITY**

The investigator will keep all written materials locked in a desk drawer in a locked office. All contents of the discussions are password protected in Canvas and any downloads of said data will be stored on a computer that is password protected. Regulations require that research data be kept for at least three years.

**HOW WILL THE RESULTS BE USED?**

The results of this study will be published in journals and presented at academic conferences. Your name or any identifying information about you will not be published. This study is being conducted as part of the dissertation of the principal investigator.

**WHO CAN ANSWER MY QUESTIONS ABOUT THIS STUDY?**

If you have any questions about taking part in this research study, you should contact the principal investigator, **Brian Dashew**, at 518-598-4703 or at [bd2340@tc.columbia.edu](mailto:bd2340@tc.columbia.edu).

If you have questions or concerns about your rights as a research subject, you should contact the Institutional Review Board (IRB) (the human research ethics committee) at 212-678-4105 or email [IRB@tc.edu](mailto:IRB@tc.edu). Or you can write to the IRB at Teachers College, Columbia University, 525 W. 120<sup>th</sup> Street, New York, NY 1002. The IRB is the committee that oversees human research protection for Teachers College, Columbia University.

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### **PARTICIPANT'S RIGHTS**

- I have read and discussed the informed consent with the researcher. I have had ample opportunity to ask questions about the purposes, procedures, risks and benefits regarding this research study.
- I understand that my participation is voluntary. I may refuse to participate or withdraw participation at any time without penalty.
- The researcher may withdraw me from the research at his or her professional discretion.
- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue my participation, the investigator will provide this information to me.
- Any information derived from the research study that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- I should receive a copy of the Informed Consent document.

#### **Question 1: Receipt of protocol**

If you have not already done so, please download and review the full Research Protocol. Please verify that you have received the protocol below.

- A. I have received the full Research Protocol.
- B. I have not received the full Research Protocol.

#### **Question 2: Consent to Participate**

To participate in this study, you will complete the required discussion activities in this course. Participation means that your posts— anonymized and aggregated with that of other students in the class— can be analyzed by the researcher. Please indicate that you have reviewed the research protocol and that you are willing to participate.

- A. I agree to participate.
- B. I will participate in required activities but I do not consent for my data to be included as part of this research study.

#### **Question 3: Who may view my participation?**

Who may view my participation in this study?

- A. I consent to allow written and/or audio taped materials viewed at an educational setting or at a conference outside of Teachers College \_\_\_\_\_
- B. I **do not** consent to allow written and/or audio taped materials viewed outside of Teachers College Columbia University

**Question 4: Optional consent for future contact**

The investigator may wish to contact you in the future. In particular, there may be an opportunity to participate in follow-up interviews. Please select the appropriate statements to indicate whether or not you give permission for future contact.

- A. I would like to be contacted in the future for research purposes or for information related to this study.
- B. I would not like to be contacted in the future for research purposes or for information related to this study.

**Protocol Title:** Goal Introduction in Discussion Activities (Interviews)

**Principal Investigator:** Brian Dashew  
518-598-4703, bd2340@tc.columbia.edu

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### **INTRODUCTION**

You are being invited to participate in this research study called “Goal Introduction in Online Discussion Activities” You may qualify to take part in this research study because you are an adult learner enrolled in and participating in discussion activities in APANPS5300: Research Design. Approximately 24 people will be interviewed as part of this study and it will take approximately one hour of your time to complete.

### **WHY IS THIS STUDY BEING DONE?**

This study is being done to determine the conditions under which students introduce and explore their own goals for learning in online discussion. In particular, you will be interviewed in order to better understand how you perceive online discussion, and in order to understand how your perceptions influence your behavior in the discussion.

### **WHAT WILL I BE ASKED TO DO IF I AGREE TO TAKE PART IN THIS STUDY?**

If you decide to participate, you will be interviewed by the principal investigator. During the interview you will be asked to discuss your experience in the online discussion. You will specifically be asked about your impression of your goals and the instructor’s goals for your participation. You will also be asked about the tools you used for discussion, the collaborative nature of the discussion, the rules and prompts for discussion, and different roles that were played by others who participated in the discussion. This interview will be audio-recorded. After the audio-recording is written down (transcribed) the audio-recording will be deleted. If you do not wish to be audio-recorded, you will not be able to participate. The interview will take approximately forty-five minutes. You will be given a pseudonym or false name/de-identified code in order to keep your identity confidential. No identifying information will be shared with your instructor and no content will be published until after the semester is over.

### **WHAT POSSIBLE RISKS OR DISCOMFORTS CAN I EXPECT FROM TAKING PART IN THIS STUDY?**

This is a minimal risk study, which means the harms or discomforts that you may experience are not greater than you would ordinarily encounter in daily life while taking routine physical or psychological examinations or tests. The principal investigator is taking precautions to keep your information confidential and prevent anyone from discovering or guessing your identity, such as using a pseudonym instead of your name and keeping all information on a password protected computer and locked in a file drawer. In addition, your interview will be deleted after the study is completed. No identifying information will be shared with your instructor.

**WHAT POSSIBLE BENEFITS CAN I EXPECT FROM TAKING PART IN THIS STUDY?**

There is no direct, immediate benefit to you for participating in this study. However, this study will inform the way in which collaborative activities are designed and facilitated in the future; it is possible that other students taking APANPS5300 will therefore benefit from your participation. In addition, some lessons learned may be leveraged in future semesters of your own course of study.

**WILL I BE PAID FOR BEING IN THIS STUDY?**

If you agree to participate in two of the interviews in this study, you will be given \$20 for your participation. You will be paid for your participation at the end the conclusion of the second interview.

**WHEN IS THE STUDY OVER? CAN I LEAVE THE STUDY BEFORE IT ENDS?**

The study will be conducted in both the Fall and Spring semester. However, your participation will only last for one semester and will be over at the conclusion of the semester. Only modules 3, 8, and 11 will be the subject of the study. You may opt out of the study at any time, but you will only be paid for your participation if you participate in two interviews.

**PROTECTION OF YOUR CONFIDENTIALITY**

The investigator will keep all written materials locked in a desk drawer in a locked office. Any electronic or digital information (including audio recordings) will be stored on a computer that is password protected. What is on the audio-recording will be written down and the audio-recording will then be destroyed. There will be no record matching your real name with your pseudonym. Regulations require that research data be kept for at least three years.

**HOW WILL THE RESULTS BE USED?**

The results of this study will be published in journals and presented at academic conferences. Your name or any identifying information about you will not be published. This study is being conducted as part of the dissertation of the principal investigator.

**CONSENT FOR AUDIO RECORDING**

Audio recording is part of this research study. You can choose whether to give permission to be recorded. However, if you decide that you don't wish to be recorded, you will not be able to participate in this research study.

\_\_\_\_\_ I give my consent to be recorded

\_\_\_\_\_  
Signature

\_\_\_\_\_ I do not consent to be recorded

\_\_\_\_\_  
Signature

**WHO MAY VIEW MY PARTICIPATION IN THIS STUDY**

\_\_\_ I consent to allow written and/or audio taped materials viewed at an educational setting or at a conference outside of Teachers College

\_\_\_\_\_  
Signature

\_\_\_ I **do not** consent to allow written and/or audio taped materials viewed outside of Teachers College Columbia University

\_\_\_\_\_  
Signature

**OPTIONAL CONSENT FOR FUTURE CONTACT**

The investigator may wish to contact you in the future. Please initial the appropriate statements to indicate whether or not you give permission for future contact.

I give permission to be contacted in the future for research purposes:

Yes \_\_\_\_\_ No \_\_\_\_\_  
Initial Initial

I give permission to be contacted in the future for information relating to this study:

Yes \_\_\_\_\_ No \_\_\_\_\_  
Initial Initial

**WHO CAN ANSWER MY QUESTIONS ABOUT THIS STUDY?**

If you have any questions about taking part in this research study, you should contact the principal investigator, Brian Dashew, at 518-598-4703 or at [bd2340@tc.columbia.edu](mailto:bd2340@tc.columbia.edu). If you have questions or concerns about your rights as a research subject, you should contact the Institutional Review Board (IRB) (the human research ethics committee) at 212-678-4105 or email [IRB@tc.edu](mailto:IRB@tc.edu). Or you can write to the IRB at Teachers College, Columbia University, 525 W. 120<sup>th</sup> Street, New York, NY 10027. The IRB is the committee that oversees human research protection for Teachers College, Columbia University.

**PARTICIPANT'S RIGHTS**

- I have read and discussed the informed consent with the researcher. I have had ample opportunity to ask questions about the purposes, procedures, risks and benefits regarding this research study.
- I understand that my participation is voluntary. I may refuse to participate or withdraw participation at any time without penalty.

- The researcher may withdraw me from the research at his or her professional discretion.
- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue my participation, the investigator will provide this information to me.
- Any information derived from the research study that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- I should receive a copy of the Informed Consent document.

**My signature means that I agree to participate in this study**

**Print name:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Signature:**

\_\_\_\_\_  
\_\_\_\_\_



## Appendix B

### Survey

#### **Introduction**

The following survey asks about your experience participating in discussions as part of the APAN5300: Research Design course. This survey should take approximately 20 minutes to complete. Information collected from survey responses will be used to analyze the design of social learning activities. Your participation in this survey is optional. Information from your responses may be shared with your instructor in aggregate, but individual responses will not be shared.

For more information, please see the attached informed consent protocol.

#### **Part I: Assessing Self-Direction**

The following questions are taken from the Self-Directed Learning Instrument (SDLI), a validated instrument for assessing readiness for self-direction in learning. Please read each statement and select the number the best describes your thoughts and feelings about your own learning. There are no right or wrong answers. Each question should be answered on the following scale: 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, 1 = strongly disagree.

1. I know what I need to learn
2. Regardless of the results of effectiveness of my learning, I still like learning.
3. I strongly hope to constantly improve and excel in my learning.
4. My success and failure inspires me to continue learning.
5. I enjoy finding answers to questions.
6. I will not give up learning because I face some difficulties.
7. I can pro-actively establish my learning goals.
8. I know what learning strategies are appropriate for me in reaching my learning goals.
9. I set the priorities of my learning.
10. Whether in practice or in the classroom, I am able to follow my own plan of learning.
11. I am good at arranging and controlling my learning time.
12. I know how to find resources for my learning.
13. I can connect new knowledge with my own personal experiences.
14. I understand the strengths and weaknesses of my learning.
15. I can monitor my learning progress.
16. I can evaluate on my own my learning outcomes.
17. My interaction with others helps me plan for further learning.
18. I would like to learn the language and culture of those whom I frequently interact.
19. I am able to express messages effectively in oral presentations.

20. I am able to communicate messages effectively in writing.

### **Part II: Additional Questions**

1. What do you think the instructor's main purpose was for developing a discussion activity?
2. To what extent was it easy to understand your instructor's goal?
  - Very difficult
  - Difficult
  - Neither easy nor difficult
  - Easy
  - Very easy
3. What additional goals did you have for participating in the discussion activity this week? If none, please write "none."
4. How easy was it to use the discussion tool in Canvas?
  - Very difficult
  - Difficult
  - Neither easy nor difficult
  - Easy
  - Very easy
5. Did the technology impact the way that you responded to your peers?
  - No
  - Yes, but not significantly
  - Yes, significantly
6. If yes, please explain how.
 

How would you describe any rules or norms that you followed as you participated in the discussion? Please note that these can be rules established by your instructor or social norms you follow in discussion with classmates.
7. How would you describe the "role" you have taken on in the discussion? To what extent do you think that role influenced the discussion?
8. How would you describe any roles that others have taken on in the discussion? To what extent do you think these roles influenced the discussion?
9. Please comment on any other aspect of class discussion you have found significant.

### **Conclusion**

Thank you again for your participation in this survey. You may be selected to participate in a follow-up interview. If you have any questions about taking part in this research

study, you should contact the principal investigator, Brian Dashew, at 518-598-4703 or at [bd2340@tc.columbia.edu](mailto:bd2340@tc.columbia.edu). If you have questions or concerns about your rights as a research subject, you should contact the Institutional Review Board (IRB) (the human research ethics committee) at 212-678-4105 or email [IRB@tc.edu](mailto:IRB@tc.edu). Or you can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY 10027. The IRB is the committee that oversees human research protection for Teachers College, Columbia University.

## Appendix C

### Interview Schedule

#### **Introduction**

Thank you for agreeing to participate in this interview. In this conversation, I will be asking you about your experience participating in discussions as part of the APANPS5300: Research Design course. I am hoping to learn more about your perceptions of how the discussion was designed and facilitated. Your honest participation is important to this research and to understanding how and why you participated in the class discussions.

Students were selected from different sections because of the way in which they participated. After we have completed the research, we will identify patterns and use these patterns in future research about student participation.

I know that you are still a student in the APANPS5300, so I want to make sure you know that I will keep your observations about the class confidential. Though I may share themes and insights with your instructor, I will only share information in aggregate and I will not share any identifying information with your instructor. I will not tell your instructor which students were selected as participants in this study.

It is important to me that I can capture your thoughts clearly and accurately. Although I will be taking notes, I will also be taping our conversation. I will not share the recordings with your instructor and I will delete all recordings after the research is complete. If you have any objections to being recorded, I will not be able to include you in this research project.

#### **1. Your Goals**

1.0. What personal or professional goals do you have for the research design course?

1.0.1. Probe: What challenges do you face at work that can be addressed by the objectives in this course?

1.0.2. Probe: How do you interpret the learning objectives as stated by the instructor?

1.0.3. Probe: How are research design principles exercised in your workplace?

1.1. How would you describe support you have for accomplishing these goals?

1.1.1. Probe: Does your organization provide financial and moral support your participation in this course?

1.1.2. Probe: Does your organization provide opportunities for your professional learning?

1.1.3. Probe: In what ways has your organization supported you sharing your goals?

1.2. How does participation in discussion help you address these goals?

1.2.1. Probe: Are there other goals that discussions help you address?

- 1.2.2. Probe: If there were no grades for discussion, would you participate—why and how?
- 1.2.3. Probe: In the “real world” what do you learn from your discussions with other people?
- 1.3. What was the relationship between your goals and your instructor’s goals?
  - 1.3.1. Probe: Were these goals in conflict? Or were they complementary? How did you reconcile any conflict?

## **2. Design of Discussions**

[Note: Many of these questions are repeated from the survey in Appendix B. If the participant completed the survey, this section may be removed or shortened. The goal of these questions is to understand the learner perception of each design element as described in the activity systems analysis framework, and to understand perception of the impact of design on student learning. If this has already been completed, these questions will be omitted. Otherwise, additional probes may be used to gain greater clarity in these two areas.]

- 2.0. Describe the Canvas Discussions tool.
  - 2.0.1. Probe: What are the most effective elements of the discussion tool? What are the three least effective elements?
  - 2.0.2. Probe: Have you used other discussion tools—either in another learning management system or elsewhere on the internet? How does this tool compare?
  - 2.0.3. Follow-up: How are the discussions you have in this tool similar to or different from productive face-to-face discussions?
  - 2.0.4. Follow-up: What impact did the design of the tool have on your ability to address the goals you described earlier?
- 2.1. Where do you generally complete your work on Canvas discussions?
  - 2.1.1. Probe: do you participate from home or work? What does the physical?
  - 2.1.2. Probe: What are things that might distract you from your engagement in participating? How do you mitigate these distractions?
- 2.2. What rules did your instructor set for participating in the discussion?
  - 2.2.1. Follow-up: What social norms or rules do you think were in place?
  - 2.2.2. Probe: How are the “rules of engagement” different between the online discussions and other discussions you have had face-to-face?
  - 2.2.3. Probe: Do you feel like everybody followed the rules set by the instructor? Why do you think that is?
  - 2.2.4. Follow-up: How would your participation be different if these rules were not in place?
  - 2.2.5. Follow-up: Describe the impact that these rules had on your ability to meet the goals you described earlier.
- 2.3. Do you think that people in your discussion group took on specific roles or did everybody have the same job?

- 2.3.1. IF PEOPLE TOOK ON ROLES: List the types of roles that you saw people taking on.
  - 2.3.1.1. Follow-up: What impact did these roles have on the way you participated?
  - 2.3.1.2. Follow-up: What impact did these roles have on your ability to meet your goals?
- 2.3.2. IF PEOPLE DID NOT TAKE ON ROLES: In an online discussion, what is a student “responsible” for?
  - 2.3.2.1. Probe: Did everybody meet their responsibility as you have just described it? Why or why not? What was the impact?
  - 2.3.2.2. Follow-up: What impact did occupying this role have on the way you participated?
  - 2.3.2.3. Follow-up: What impact did these rules have on your ability to meet your goals?
- 2.4. What does a “learning community” mean to you?
  - 2.4.1. Follow-up: Do you feel like a learning community was established in your class? Why or why not?
  - 2.4.2. Follow-up: What did your instructor do to build a learning community?
    - 2.4.2.1. Probe: Can you tell me a story about your instructor interacting in a way that built or fostered community?
  - 2.4.3. Follow-up: What did other students in your class do to build or support a community?
    - 2.4.3.1. Probe: Can you tell me a story about another student interacting in a way that built or fostered community?
  - 2.4.4. Follow-up: What did you do to build or support a community?
    - 2.4.4.1. Probe: What cues existed that helped you know that you should be taking steps to build community?
  - 2.4.5. Follow-up: What impact did the community play in your ability to meet your goals?

### **3. How You Engaged**

3.0. Let’s look at how you participated in this week’s discussion. Describe your approach to completing this assignment and engaging in the activity.

[Note: the following probes may be used for additional detail if they are not addressed in the initial response to question 3.0 above]

- 3.1. Did your approach change at all after others began participating in the discussion? If yes, how?
  - 3.1.1. Probe: Do you feel like you had a specific style? If so, did you have to change this style at any point? How did people respond to this style?
  - 3.1.2. Probe: What factors influenced your posting behavior? Consider both what you posted and how/when you posted.
- 3.2. Everybody approaches their school work in different ways. Describe your approach when you first receive an assignment to participate in a discussion.
  - 3.2.1. Probe: How do you identify what the instructor is asking you to complete?
  - 3.2.2. Probe: What is the first thing you do when you see a discussion prompt?

3.2.3. Follow-up: Describe your management style as the discussion continued? Was this similar to or different from your initial approach?

3.3. What was the outcome of your discussion?

3.3.1. Follow-up: Do you think you met the instructor's goals? Why or why not?

3.3.2. Follow-up: Do you think you met your personal goals? Why or why not?

### **Conclusion**

Okay. I think that is all of the information I need at this time. Based on your consent in the form that you signed at the beginning of this interview, I may be contacting you again in the future if I have any other questions. Before we end, I want to ask you if there is anything else about this topic that you would like to share with me [pause for response]. Thank you again for your participation and have a great day.

## Appendix D

## Mapping Research Protocol to Research Questions

The following tables map the questions in the survey and interview protocols to information that will be gathered, research propositions (as defined in Chapter III) and research questions (as defined in Chapter I).

Table AD.1

*Mapping Survey Questions to Research Questions*

<b>Question</b>	<b>Information Gathered</b>	<b>Proposition</b>	<b>Research Question</b>
<b>Part I: Self-Directed Learning Inventory</b>			
1-6	Learner motivation	3	1,2
7-12	Planning and implementation	3	1,2
13-16	Self-monitoring	3	1,2
17-20	Interpersonal communication	3	1,2
<b>Part II: Activity System Development</b>			
1	Student impression of instructor-defined activity goal	1	1
2	Student impression of instructor-defined activity goal, rules	1	1
3	Student identification of personal goal, learner motivation	3, 4	2
4	Student impression of tool	2, 4	1, 2
5	Student impression of tool, community, interpersonal communication	2, 4	1, 2
6	Student impression of tool, community, interpersonal communication	2, 4	1, 2
7	Student impression of rules, interpersonal communication, self-monitoring	2, 3, 4	1, 2



8	Student identification of rules, community of inquiry, self-monitoring, interpersonal communication	3, 4	1, 2
9	Student impression of rules, community of inquiry, interpersonal communication	3, 4	1, 2
10	Open response	1, 2, 3, 4	1, 2

Table AD.2

*Mapping Interview Questions to Research Questions*

<b>Question</b>	<b>Information Gathered</b>	<b>Proposition</b>	<b>Research Question</b>
<b>Part I: Your Goals</b>			
1.0	Student identification of goals, student identification of tension with instructor-defined system, self-motivation	1, 3	2
1.1	Planning and implementation, student understanding of greater activity system, self-motivation	1, 2, 3	2, 1
1.2	Student understanding of activity system, monitoring and mediation	1, 2, 3	2, 1
1.3	Monitoring and mediation, tensions in activity systems	2, 3	1
<b>Part II: Design of Discussions</b>			
2.0	Tools, implementation and planning, monitoring	2, 4	1
2.1	Tools, implementation and planning	2, 4	1
2.2	Rules, community of inquiry, identification of goal tension, identification of rule/community tension	2, 3, 4	1, 2

2.3	Rules, community of inquiry, identification of goal tension, identification of rule/community tension, mediation	2, 3, 4	1, 2
2.4	Rules, community of inquiry, identification of rule/community tension, mediation, monitoring	2	1, 2
<b>Part III: How You Engaged</b>			
3.0	Open: all tensions, motivation, monitoring, and mediation	1, 2, 3, 4	1, 2
3.1	Motivation, monitoring, mediation	3, 4	1, 2
3.2	Open: goals, motivation, implementation and planning	1, 2, 3, 4	1, 2
3.3	Outcomes, student impression of instructor-defined outcome, student identification of personal outcome.	3, 4	1, 2

Appendix E  
Codes and Definitions

Table AE.1

*Codes and Definitions*

Code	Description
"Got stuck"	In vivo code. Originated with Starla.
"New to me"	In vivo code. Originated with Starla.
"not didactic"	in vivo code. Expressed by ZK; expresses a desire for interaction in the course (not restricted to online discussion).
American culture	American popular culture. Generally references arts, museums, clubs, or non-curricular activity.
Analytics as business program	In vivo code raised by Patton.
Balance	Student reference to needing to find balance, strike a balance, or else ease tension. NOTE: rationale for taking program?
Career goal	Explicit mention of an expected professional outcome.
Case Study	Instructor-provided examples of real-world application, generally in prompts for discussion.  NOTE: unique from outside example in that students provide outside examples and cases are structured as examples of application.
Challenge	Pedagogical (teaching or learning) difficulties encountered by student or instructor.
Chinese culture	Chinese popular culture or ways of being. American impressions of Chinese culture count in this code.
Collaboration	Interpersonal communication for teaching and learning purposes. [Collapsed collaboration and communication into collaboration]
Comfort	Student description of a condition in or situation in which they feel camaraderie or friendship among their group or class.  NOTE: linked to but distinct from willingness to share
Communication	Student self-description of interpersonal communication behaviors or analysis of another student's behaviors.
Community	Structural code. Refers to the group of participants with whom the student engages in the activity.

Comprehension	Understanding of core concepts [of research].
Conflict	Interpersonal conflict. Described by Starla as distinct from disagreement because it carries hostility.
Course goal	Student description of an anticipated outcome at the course level.
Disagreement	Content conflict. Described by Starla as distinct from conflict because it is about content, not people.
Diversity	Difference of experience or culture.
Division of Labor	Structural code. How the work is split among participants in the activity system and the impact those roles have on the overall outcome.
Efficiency	Student impression of how their time is being used. Efficiency is when activities are designed to minimize effort and time.
Environment	The industry environment; external environment from class experience.  NOTE: do not use this code for student description of course environment.
Explicit instruction	Student request for explicit instruction. Requests to the researcher should be tagged with this code.
Extra-curricular	Activities still in support of student learning, but not taking place in the classroom or as a required part of the assignment.
Fairness	Student discussion of equity (example: instructor grading, share of work on group assignments, students copying/mirroring).
Familiarity	Sentiment expressed that expertise is required prior to taking a specific role in discussion. May alternately refer to individuals requiring familiarity of individuals to grant them a particular role.
Flexibility	Student expression of need. May be used to describe need for flexibility of time or flexibility of content for application to personal experiences.
Focus	Student ability to focus on specific areas of content, or systemic boundary objectives that force students to focus on specific areas.
Friends	Social relationships.
Grading	Instructor grading. May alternately refer to instructor incentives for activity completion (e.g. instructor review or expectations).
Implementation and planning	Student description of self-process.
Incoming goal unknown	Learner expresses confusion over own motivation or the intentions of the instructor.
In-Person	vs. online. Students comparing the online and in-person experience.

	Student discussion of instructor activity (or inactivity) in course or course discussion.
Instructor facilitation	NOTE: similar to instructor self-assessment but from the student perspective.
Instructor self-assessment	Instructor discussing their own teaching practice, especially evaluating the efficacy of practices they have introduced.
Leadership	Role--may have several meetings based on the individual's view.
Learning about yourself	Potential student outcome: metacognitive or self-awareness.
Learning from others	Student describes social learning.
Learning goal	Goal associated with developing facility with course content.
Learning objective: business process	Stressed by Mel; distinct from professional application because talking about the business side of analytics project, not application of research in a business context.
Learning objective: making decisions	LO (course, task, or program) related to student ability to make effective organizational decisions as a result of data and analytics or related to the introduction of research principles in practice.
Learning objective: more complex experimental design	LO (course, task) described by Hellen. Student ability to combine basic tools into increasingly intricate structures; student ability to consider the political landscape in which research is being executed and build those considerations into the research design.
Learning objective: professional application	Instructor expressed goal of student application of research practices in a professional context (preferably one of their own definition).
Learning objective: research as a communication tool	LO (course, task). The importance of understanding how to communicate about research and how research is used in organizational settings to gain buy-in from leadership for change initiatives.
Learning objective: understanding research	LO related to understanding basic principles and terminology related to research design.
Learning objective: way of thinking	LO related to a generalized approach to work in the analytics field. Expressed (but not defined) by Patton.
Learning goal: seeing the perspectives of others	LO related to the ability of research to provide evidence of different opinions. Associated with student codes re: difference, negotiation.

Learning objective: practice English language proficiency	Task goal only; student goal for discussion as a space to practice using English in a shared context.
Limited time	Concern that there is not enough time to complete a course activity.
Long-term relationship	Student references an interpersonal connection from the temporal perspective. Note: Changed from long-term connection.
Mediation	Moderating the activity system for self-directed purposes. .
Mirroring	Copying the structure or content of another person's response.
Monitoring	Structural code taken from Garrison. Self-awareness/efficacy in the system.
Motivation	Rationale for student engagement the course or program, not related to a specific outcome or objective.
Natural	Student description (often in vivo) of inherent qualities. Generally descriptive of roles (specifically leadership).
Needs clarity	Student asks for additional clarification from the researcher NOTE: is this the same as explicit instruction.
Negotiation	Student attempt to ease tension, etc.
Noise	Distracting communication NOTE: can be from instructor, student, or system
Not a discussion	Student questions whether this should be considered a form of discussion.
Not time restricted	No time limits on a given activity.
Openness	Willingness to listen to the opinions of another student. NOTE: not necessarily willingness to share.
Organizational context	Cases, or settings in which research is being used.
Outcome	Structural code related to output of an activity system.
Outside examples	Student or instructor generated examples from outside of the course. NOTE: not structured cases.
Personal feelings	Student's emotional reaction to event or individual.
Pressure	The need for the instructor to withhold credit or points if students do not complete activities (recognized by Mel). Alternate def: the feeling of students to present their best professional selves among a cohort of skilled professionals.

Problem-Solving	Process code. Student reference to solving problems or cases.
Program goal	What the student hopes to learn from completion of the program; distinct from career goal in that CG is often a PG applied.
Reflection	Recognition of thoughtful reflection on discussion (may have a temporal dimension)
Relevance	Alignment of cases to student experience and background. Critical for AC.
Roles	Analogous to a structural code (DOL)—student perceptions of the division of labor and unique roles played in task completion.
Rules	Structural code--student perceptions of the rules set by the instructor; also references rules for etiquette in the discussion.
Structure	Student discussion of the course flow.
Student difference	Student recognition of different opinions and backgrounds, specifically references the role difference plays in collaboration, negotiation, and goal attainment.  NOTE: distinct from student experience which is more restrictive and not necessarily tied to communication.
Student experience	Description of the student population's professional and academic experience. May be proxy for age.
Student process	Student description of thought process and activity completion process. Different from Structure in that they are talking about themselves, not the course design.
Task goal	Goals associated with a specific activity.
Technical competency	Proficiency in analytics or coding.  RENAMED: from basic technical to align with theoretical competency.
Tension	Disconnects across the activity system.
Theoretical competency	Prior experience related to theory (non-technical).  NOTE: changed from theoretical background to align with technical competency.
Time: immediacy	Immediacy refers to time lag in synchronous discussion.
Tools	Structural code. Student references technology for discussion.
Transfer	Student is able to apply course concepts to an outside context.
Value	Additive nature; not replicating existing posts; academic citizenship; building process.
Waste of time	Student expression that an activity served no purpose.
WeChat	Chinese chat tool.
Willing to share	Student willingness to share in discussion.

## Appendix F

### Full Design Suggestions for Research Design

This study has demonstrated a number of features about self-directed learning and individual goal introduction. Self-directed learning should not be treated as an inherent assumption among adult learners, although individuals do seem to seek it as a quality. However, systemic tensions present within designed instructional are a deterrent to individual goal introduction. Students either default away from self-direction or else they demonstrate mediating behaviors to overcome these tensions. Therefore, those interested in promoting self-directed learning should conceptualize design strategies that aim to do one of two things: they must either decrease the impact of systemic tensions or else increase the opportunity for students to exercise mediating behaviors. The discussion below describes how these might be realized through emergent practices in instructional design and future research.

As described Chapter IV, this study took place in a course environment using common instructional design practices and run on a market-leading learning management system. Yet the findings of this study indicate that both the functionality of the tool and the manner in which students were asked to interact in the system may have caused tensions. To that end, this appendix is dedicated to the reimagining of learning activity and discussion tool design.

#### **Redesigning Learning Activities**

**Encouraging reflection.** Goal confusion is addressed through efforts to connect across the various dimensions of goal (professional-program-course-task) and through



attempts by learners to locate themselves within the activity. To reduce the impact of this tension and increase mediation towards personal goals, instructional activities must promote reflective behaviors.

In the Research Design course, students were asked to respond to a set of prompt questions about a case study. After the live session, they were asked to continue the discussion of the case and—eventually—to draw parallels between their answers and their own professional experience. However, students described difficulty in connecting the findings about a case organization to their own organizational context. This may be because they failed first to connect the question or the case context to their own experience. More often than not, students interviewed described a primary goal of understanding course content, with professional application to a case as secondary. Such an approach could be seen as an instrumental approach (Drago-Severson, 2009) in which students' primary concern was the correct identification and use of course concepts.

Reflection has traditionally been seen as mechanism for creating meaning from new experiences (Roessger, 2017). In the context of this research, however, reflection is intended as an activity that primes the learner to create meaning. Reflecting on the prompt and case question and their connection to a students' own context and personal learning goals can help students to locate themselves within the case. Doing this prior to and while students are responding—rather than at the conclusion of the activity—might mean that students are more likely to focus on the connections between the question and their own context, rather than trying to connect what they perceive as a correct or incorrect answer to their context. This distinction can be seen as the similar to that raised by Schön's comparison reflection-in-action and reflection-on-action (1983). The former

involves a continuous, in-situ examination of the self and ways of doing; the latter is the post-activity reflection that the existing prompt encourages. Encouraging reflection-in-action might enable students to connect to the prompt on different levels and to reflect on how and why they answer the question—as opposed to simply seeking ‘correct’ answers.

Related to reflection-in-action, students should be encouraged to make reflection a dialogical—rather than individual—process. Tyler and Swartz drew a distinction between storytelling as a collaborative act and narrative expression (2012). A narrative is constructed to socially accepted structures. In contrast, storytelling is an organic and reflexive. This distinction can also be applied to reflection. Personal reflection may be self-fulfilling, leading to findings that reinforce what the student already knows. This may explain why students were more willing to participate as a leader for activities in which they already viewed themselves as having expertise. Reflective discourse, on the other hand, is analogous to storytelling. Students may learn from each others’ reflections, finding new ways to connect the question and case to their own experience. In addition, engaging in public reflection may serve to address another concern expressed about sharing personal goals: that participants felt there was no point in connecting responses to their organizational context because no other student had enough prior knowledge to respond to their observations.

**Addressing time and structural issues.** Structure and time were also significant barriers to student participation in the discussion activity. Students expressed frustration, for example, that they had trouble early in the class understanding how all of the pieces would come together. This manifested in students describing confusion between the goals and the takeaway. Howard said that it would often be two to three weeks after content

was presented before he truly understood it. At that point it was too late. Another concern expressed about time was the overlap of activities. This made it difficult for students to prioritize participation in discussion. Both of these barriers could be addressed through restructuring the course activities.

**Attending to whole-course design.** Recall in Chapter IV that there was discussion of the design process emphasizing narrative structure. The prevailing metaphor for course design is a narrative arc, with courses—and lessons within those courses—being designed to tell the story of the content. Such a model assumes that a course has a defined beginning, middle, and end. It assumes that the sum of these conceptual introductions is equal to a full course experience. These assumptions are problematic for two reasons. On the one hand, they reinforce the fixed nature of the learning experience. Narratives, it has been argued above, are fixed and impermeable; if students do not wish to disrupt the narrative flow, then goal introduction is to be avoided. At the same time, they are problematic because students expressed that they need to see—and reflect on—the end before they are introduced to its component parts.

An approach that emphasizes the whole prior to exploring its component parts may be a solution to address this concern. This can be framed as the distinction between inductive and deductive reasoning. Induction—starting with the small pieces to build the whole—can be replaced by deduction, where the broader perspectives are introduced and subsequently analyzed from the perspective of the smaller components. Consider Grover, who was upset to learn at the conclusion of the final course of the program that his personal goal of extending his dissertation research was not going to be realized. If he had understood the whole curriculum before he took any class, this frustration might have

been avoided. A precedent for such narratives already exists in the form of systems-based approaches. These approaches have emphasized breaking down disciplinary borders and units of analysis. World-systems analysis, for example, suggested looking not at specific nation states as an analytical unit, but at the dynamical forces that “cut across many political and cultural units” (Wallerstein, 2004, p. 17). New narrative structures that are based on a systems orientation might be a solution to the temporal-structural disjuncture.

**Attending to ‘seat hours.’** A second approach is simply to be more mindful of the amount of time required for discussion. In the Research Design class, discussions counted for 25 percent of the final grade in the course. By contrast, their weekly individual assignments comprised 35 percent of the final grade. Students described prioritizing their other work over engagement in the discussion and said that the multiple weekly deadlines were overwhelming. A solution may be to reduce the amount of work that students have. This would clear student time to participate in the discussion, but it would also increase the relative weight of each discussion activity. Discussion that spans two weeks might serve several purposes. First, students’ initial posts could be due after the live session rather than before. This would reduce student anxiety about being asked to publicly present their understanding of the content before an instructor reviewed the material. Second, discussion that spanned multiple topics might increase the student belief that the activity is related to larger course goals, rather than being restricted to specific concepts or content. Third, it would give students an opportunity to extend discussion. Rosemary’s concern that the discussion is simply abandoned in favor of other assignments might be remedied by more space for discussion.

**Role definition.** A final intervention is more clarity around the roles that students are expected to play in the system. Student perception of their own role in discussion impacted behavior in two ways. First, students tended to assign roles based on incoming comfort. Consequently, a second tension was that students deferred to more expert leaders with little room for disagreement in their discussion. A key question that emerged from this area of study is whether the questions posed in the discussion forum were intended to be the object of the activity system, or if they were simply guidelines to help students in the process of achieving a goal. If—as suggested in the introduction of this study—discussions are designed to be spaces where students can engage in dialogue about concepts in the course and introduce their own learning goals in a social learning system, then a question in a prompt should be viewed as a means to an end rather than an end in of itself. However, this is not how students described their understanding of the goals of these activities nor is it how they described their behaviors during these activities. Two design interventions that might address this tension are clarifying the object for students and assigning specific roles that encourage disagreement.

**Clarifying the object.** One observation made by students was that discussion forums were not as productive as group projects with respect to their ability to foster interaction. But even in these group projects, the method of interaction most frequently described was strict division of labor with collaboration at the beginning focused on understanding the assignment and collaboration at the end when students were tasked with bringing their various pieces together. Yet among students in discussion, there were few interactions that addressed process in this way. Students described mirroring behaviors in which individuals copied the format of the first posters, but there was no

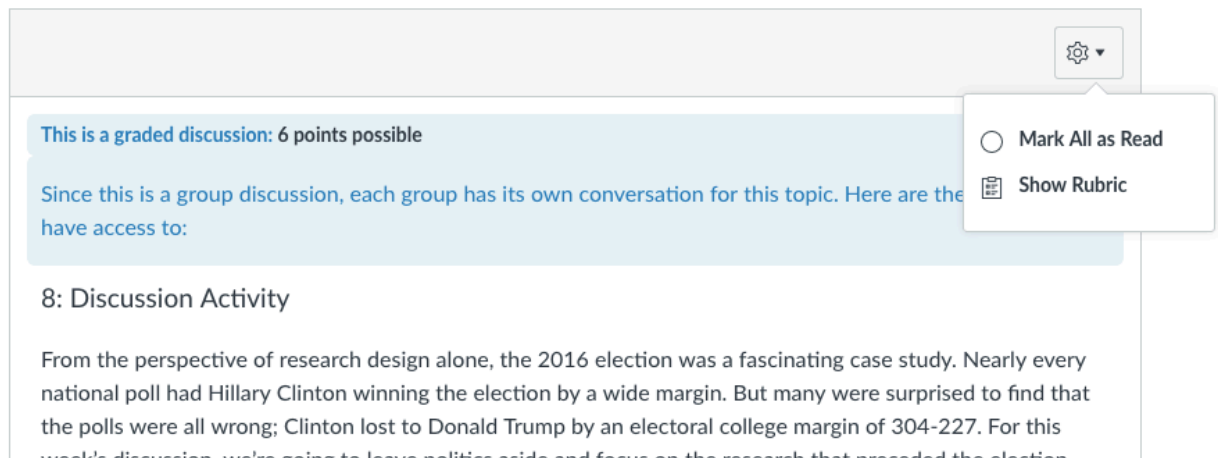
explicit discussion about how they would post or what their interactions would look like. This highlights a key distinction between these two types of activities. In group projects, students are more aware of the production aspect, while the focus of discussion is more on answering questions than creating productive discourse. Student awareness of productive discussion as a focal objective of the forum activity might influence behavior, particularly if the grading rubric was reflective of this aim. The following assessment criteria are currently described for evaluating discussion:

Your discussions in this class will be evaluated based on your contributions to the discourse, your use of course concepts, and your ability to apply your understanding of research design principles to practice examples identified by the initial prompt or raised within the class community.

Though the instructors agreed that each criterion would be awarded two points (for a total of six points), it was also true that the rubric in Canvas discussions are not immediately visible to students; instead, they needed to click an icon in the upper right corner of their screen and select “show rubric” from a drop down menu as seen in Figure AF.1. In other words, the paragraph above is the only directly visible assessment criteria for students. This paragraph promotes the importance of students’ individual contributions, their understanding of concepts, and their understanding of principles. This conforms with student description of the activity as an individual assignment, wherein they received full credit for participation.

A two-part approach to addressing this problem would be defining new grading criteria that highlight the collaborative, production goals of the activity and making the rubric for these criteria more visible. Though additional research would be needed to fully define the range of productive behaviors, there is some indication from this research that behaviors such as constructive disagreement, attempts to divide labor or draw

conclusions, demonstrated appreciation for the context of other students, and posing thoughtful questions may encourage students to view the discussion forum as a more productive space. If these behaviors were given significant weight in the rubric, it may change the way that students view the discussion forum.



*Figure AF.1: Visibility of discussion rubric*

Another approach could be to limit the number of questions posed in the discussion. The prompt in module 8, for example, includes at least eight questions. The volume of boundary objects may make the discussion appear impermeable because students are concerned about their ability to fully meet the instructor's demands. Across all cases, introducing a personal context is the final question posed, meaning students may have exhausted their required posts before they reach that question. Fewer questions with greater emphasis on the type of environment or discussion that students are meant to create might actually be more productive; by decreasing the number of questions, goals and objectives can be emphasized over discrete subject matter, and the emphasis can be replaced on objectives.

*Assigning roles.* Finally, one mechanism that might be considered as a design intervention is assigning specific roles for participation in discussion. Though some students described a leader position (often the first person to post each week), the prevailing sentiment was that most students took up the same role in discussion: to answer the instructor's questions. This created a difficult situation because the initial turn for each student was occupied responding to somebody who was not actually a participating member of the group (the instructor) and—as a matter of design—failing to respond to one another. Each week began with this stagnant series of responses that did little to advance the conversation.

One way to avoid this in future discussions would be to limit the number of people who provide initial responses to the instructor. This would increase the number of people who could be assigned alternative roles. Such roles might include a dissenter who intentionally seeks out different opinions and a convener who is responsible for reporting on the findings and drawing conclusions on discussion. Skifstad and Pugh (2014) identified four “disciplines” for driving innovation through collaborative discussion (integrity, courtesy, inclusion, and translation), which Pugh then used to define the role of ‘social reporter’ in online courses she taught at Columbia University. In that case, the social reporter was responsible for identifying students’ use of the identified disciplines, meaning she was able to use roles to emphasize the importance of particular behaviors in discussion. Further research would be needed to identify what roles would be needed to promote self-directed learning behaviors and whether these roles were constant from context to context.



## Redesigning Discussion Tools

As discussed in Chapter IV, one of the aims of the 2014 research that informed this study (Baker Stein et al.) was to determine whether student interaction in discussion forums called for the redesign of discussion tools. Major learning management systems deploy discussion forum tools with similar feature sets, including threaded discussions, rich text editor capabilities, and email notifications. This research suggests that some specific features in development may help promote productive discussion and encourage students to engage in self-directed behaviors. These include targeted notification, multimodality, and visual mapping of discussions.

**Targeted notification.** In the Canvas Learning Management System, students have the ability to “subscribe” to discussions if they would like to receive notifications about any future postings. By default, they are subscribed to any discussion to which they post. One of the powerful features of Canvas is the ability of students to select how they receive their notifications as shown in Figure AF.2—including different media (e.g. email, phone, Facebook or Twitter notifications) and timelines (immediately, daily or weekly digests) for each type of notification. However, the only possible notifications within discussions are to be notified of new discussion topics and to be notified of new posts in the topic. This does not present the degree of granularity necessary for students.

The lack of targeted notification means that students often miss responses that were intended for them. Students described “noise” associated with the discussions and notifications, because it was impossible for them to determine the context of responses that were emailed to them, meaning that they still had to return to the discussion forum regularly to see if any posts were for them.

## Notification Preferences

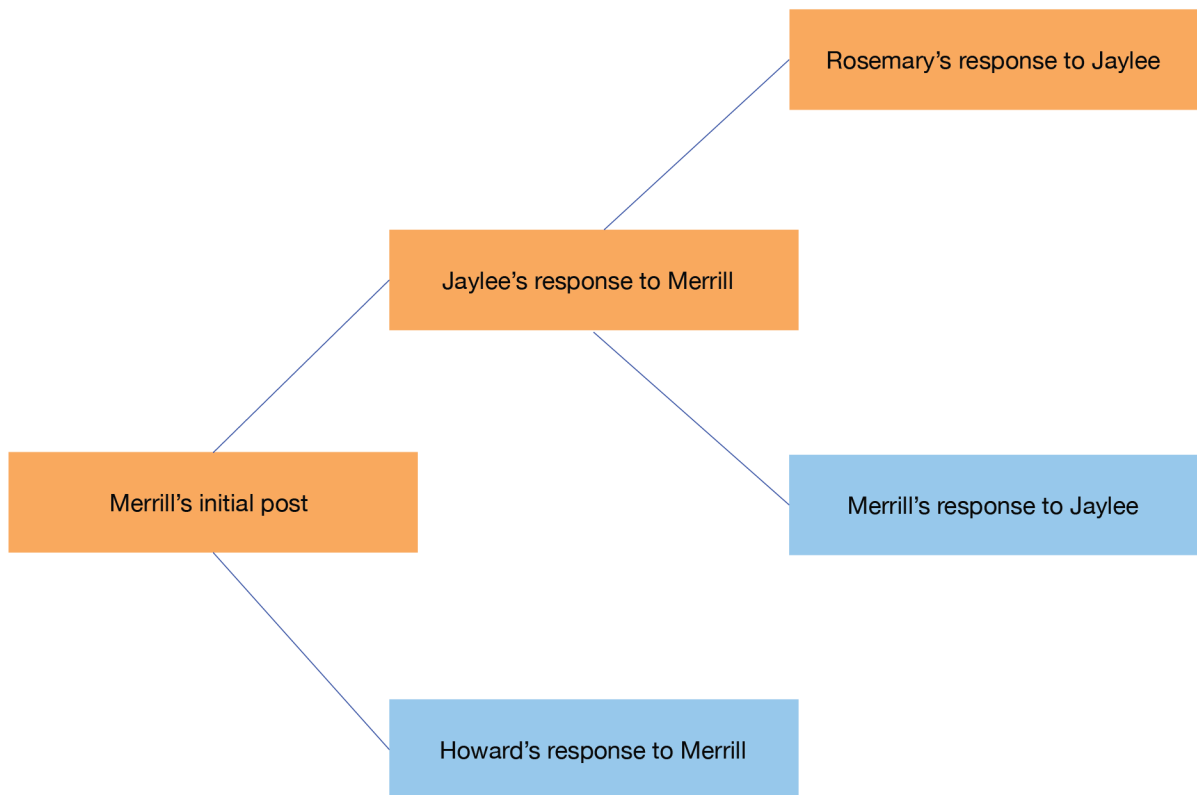
Notify me right away    
  Send daily summary    
  Send weekly summary    
  Do not send me anything

Course Activities	Email Address	Cell Number
Due Date	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Grading Policies	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Course Content	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Files	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Announcement	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Announcement Created By You	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Grading	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Invitation	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
All Submissions	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Late Grading	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Submission Comment	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Blueprint Sync	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<b>Discussions</b>		
Discussion	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Discussion Post	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>

Figure AF.2: Canvas notification preference window

A simple solution to this problem would be for notifications to differentiate the post to which they were responding. Students could receive a digest that divided responses between “responses to you,” “responses in threads you have participated in” and “responses to prompt.” The difficulty associated with this type of feature is that students might still miss posts that are related to their post but are not direct responses to their post. Therefore, ‘responses to you’ should include any post that is on the branch of a thread in which students have been a participant. Returning to an example that was given earlier, imagine that Merrill has opened a thread and that both Jaylee and Howard respond to Merrill. If Rosemary decides to respond to Jaylee, then both Merrill and Jaylee (but not Howard) should receive this notification as a ‘response to you.’ This single

branch is represented in Figure AF.3. Howard should receive this as a response in a thread in which he has been a participant.



*Figure AF.3:* Single branch highlighted in orange

A more elegant approach to this problem might be to build a notification system that is targeted based on key words or natural language processing. Howard was placed in a group with more advanced students who had prior professional experience in a variety of sectors. He described seeking out Grover's posts because of his familiarity with the finance industry, but avoiding other posts that talked about the application of analytics in pharmaceuticals and medical industries. This indicates that there may be value if the notification feature were smart enough to complete two tasks: recognize what features of

a post would have been more attractive to Howard (based on industry experience and expertise) and highlight those posts for him to read.

At the beginning of the course, students engage in a number of activities that are designed to help acquaint them to one another. These include completing a profile in Canvas (this done once and follows the learner from course to course), a “Getting to Know You” forum activity in which they post brief biographies, and an initial paper describing their ideas about possible research topics for their final projects. These could be used to identify a set of keywords that describe the learner’s interests. Further, if students are already entering contact information for social networks in order to receive notifications from the system, these networks could also be searched for key descriptive features of student interest. Even more advanced, these tools could also be used to analyze student posting patterns from a predictive perspective to identify both the content and discursive features to which students are more likely to respond in a social setting. If these searches were then used to highlight to learners posts in the system that may be of greatest interest to them, that might increase their likelihood of responding. It would also increase their capacity to build networks and relationships in the system.

An important caveat to this feature is that Canvas currently only enables students to see the posts of other students in their discussion groups. In order for this to have maximum effect, students would need to be able to see across and contribute to other discussion groups. It may even be the case that discussion groups are not fixed and could be merged, discarded, or extended as instructors and participants see fit.

**Multimodality.** Especially given the large Chinese population in the course, a number of students drew comparisons between the discussion tool and WeChat. The key

technical difference was the affordance of immediate response in WeChat, where students were often waiting days between responses on the discussion forums. Even beyond that, however, other students lamented that the discussion features felt antiquated and static, noting that the tool lacked effective methods for including multimedia content and collaborative editing.

For this reason, features that enable learners to move back and forth between modalities might be preferential to the current 'locked' nature of discussion tools. Currently, a rich text editor is featured in the discussion, which enables students to change fonts or add images and mathematical formulas. They are even able to add video content by using their computers web cam to record brief audio or video content. Basic multimedia features are therefore already enabled in discussion. What is not currently present in the forum tool is the ability for students to modulate between live and asynchronous communication, nor is it possible to easily collaborate on a common product.

It is interesting to note that many of these features are already independently embedded in the Canvas learning management system. A Chat feature enables students to see what other users are currently online and launch synchronous, typed chat. Collaboration features include integration with Google Docs for shared document editing and Big Blue Button for synchronous web conferencing. Yet Canvas does not allow students to move between these media within the same forum. Enabling the set of features to co-exist could transform the collaborative nature of discussions. When a student enters the forum, they could see the existing posts; if another learner is currently online and wants to engage in live text or video chat, learners could begin a live

conversation. This conversation could be recorded and included as a post in the discussion.

In addition, students are often tasked with coming to consensus in discussion, but they do not have tools for collaborative editing. The result is that it is often one person's role to draft an initial post that summarizes key points from the discussion and combines them into a single attempt at collaborative writing; this was a leadership role that several students identified in interviews. However, this behavior does not comport with the collaborative values that students described for group projects. If instead students were able to embed in the discussion a Google Doc that could serve as a site for collaborative editing, they could work together to create a defined product within the forum. This may also have the effect of reinforcing discussion as a space for group work rather than individual work.

**Visual mapping.** Traditional discussion forums are organized so that students are able to follow the linear path from one idea to the next. While this makes sense from an organizational perspective, it does not necessarily make sense from a dialogical perspective. Conversations are nonlinear in nature. What one individual says inherently impacts what another person is going to say; in large groups, discussions may segment off into smaller pieces and merge together several times during the span of an activity. Picture a large party with 50 guests together in one room. It is unlikely that the 50 people stand in a big circle talking to one another. Instead, people will likely gravitate to two or three other individuals and small pockets of conversation will take place. But it is equally unlikely that if the event lasts for three hours that the groups are static. One person will overhear an interesting conversation and join another group; another might go to the bar

and return with another friend that alters the composition of the group. Still other groups might simply run out of things to say and disband entirely and find themselves joining other discussions already in progress. In those new groups, somebody may say something that prompts the new member to recall a member of their abandoned group and set them off in search of that person to bring them into the new conversation. Discussion forum tools have no mechanism for enabling such behaviors and they lack a mechanism for visual organization that would consider such activity.

Visual mapping (illustrated in Figure AF.4) may serve as an organizational mechanism for approaching these more fluid, nonlinear discussions. Visual mapping was used in earlier research to help explain patterns of posting behaviors and to demonstrate the impacts these behaviors had on how discussion unfolded over a week. Used correctly, it could also serve multiple purposes for students. First, they would be able to see where discussions of interest are taking place. In addition, it would allow them to track discussions back to an initial prompt; if students wanted to join a conversation already in progress, this would allow them to simply review what had already been discussed so that discussions would not be stuck in place reviewing the same concepts on repeat each time a new member joins. Finally, it might allow a simpler mechanism for reviewing where new discussions have been added. Currently, the only way for students to see if new posts have been added in response to their comments are to find their posts and scroll to see if anything has been added. Even then, the threading features mean that students need to engage in the inauthentic practice of salutations at the start of each post. If students could visually demonstrate to whom they were responding, such actions would be unnecessary.

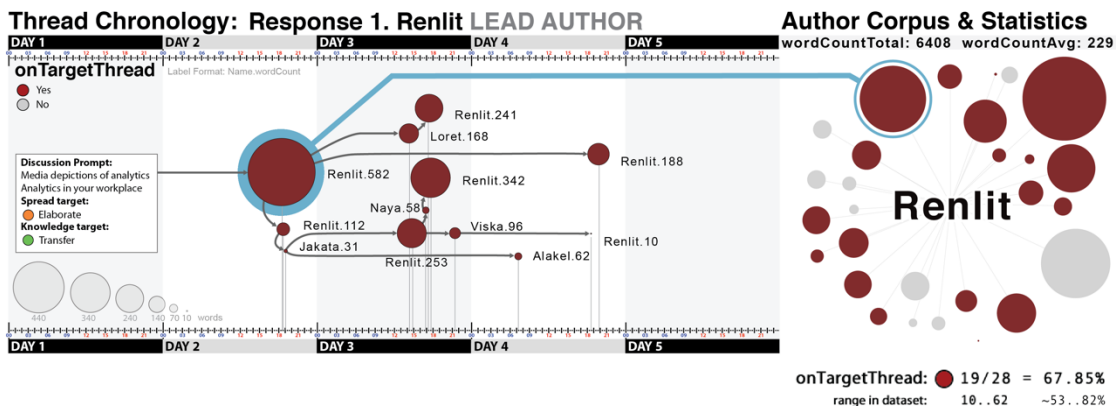


Figure AF.4: Sample visualized discussion (Baker Stein et al., 2014, p 96)

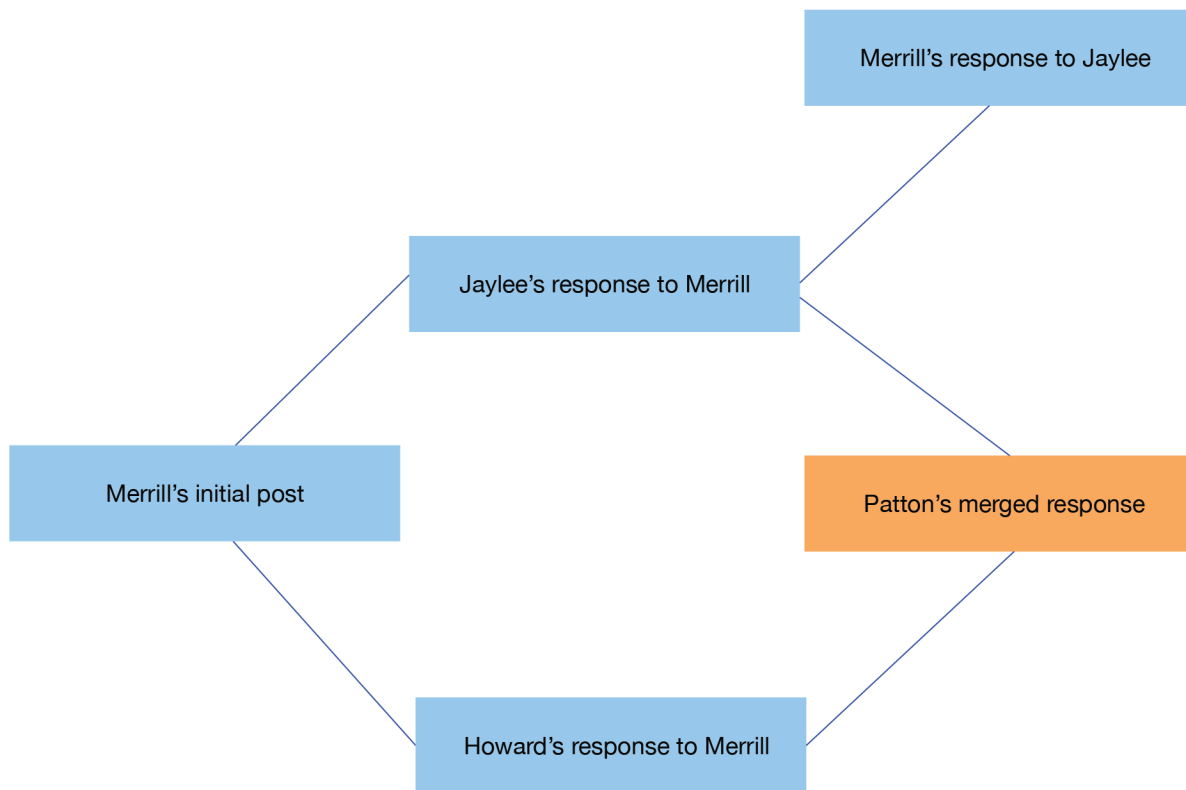


Figure AF.5: Merging discussions (highlighted in orange)



From an instructor perspective, one difficulty of current discussion tools is an inability to connect one post to another. For example, if Jaylee and Howard made opposing points but had not yet found each other's posts, there is no simple mechanism for Patton (an instructor) to point the students to one another's responses. A visual map that allowed the instructor to post and draw a clear line back to both posts—as illustrated in Figure AF.5—would enable them to consolidate ideas and encourage interaction in the system.

### **Summary**

This discussion has extended the implications for student goal identification and self-directed learning behaviors by defining several factors that might influence discussion activity in online learning. Broadly, these design factors can be split into two categories: changes to the ways in which these activities are designed and facilitated and changes to the technological systems in which they are used. A summary table (AF.1) describes these changes. While these recommendations for design are based on the findings of this study, more research is required to identify what impact they have on student learning.

Table AF.1

*Summary of Recommendations for Design*

Area	Recommendation	Impact on tension/mediation behaviors
Activity	Encouraging reflection	Decreases <ul style="list-style-type: none"> <li>• Goal confusion</li> </ul> Increases <ul style="list-style-type: none"> <li>• Connecting across dimensions</li> <li>• Locating themselves</li> </ul>
	Addressing time and structural issues <ul style="list-style-type: none"> <li>• Whole-course design</li> <li>• Seat hours</li> </ul>	Decreases <ul style="list-style-type: none"> <li>• Structural and temporal disjuncture</li> </ul> Increases <ul style="list-style-type: none"> <li>• Identifying boundary permeability</li> <li>• Appreciating time</li> </ul>
	Role definition <ul style="list-style-type: none"> <li>• Clarifying object</li> <li>• Assigning roles</li> </ul>	Decreases <ul style="list-style-type: none"> <li>• Role definition by comfort</li> <li>• Learning from versus learning with</li> </ul> Increases <ul style="list-style-type: none"> <li>• Leveraging difference</li> <li>• Recognizing value of disagreement</li> <li>• Recognizing value</li> </ul>
Tool	Targeted notification	Decreases <ul style="list-style-type: none"> <li>• Tool promotion of artificial discourse</li> </ul> Increases <ul style="list-style-type: none"> <li>• Talking about communication</li> <li>• Identifying value permeability</li> <li>• Locating themselves</li> </ul>
	Multimodality	Decreases <ul style="list-style-type: none"> <li>• Goal confusion</li> <li>• Tool promotion of artificial discourse</li> <li>• Learning from versus learning with</li> </ul> Increases <ul style="list-style-type: none"> <li>• Talking about communication</li> <li>• Leveraging difference</li> <li>• Recognizing value</li> </ul>
	Visual mapping	Decreases <ul style="list-style-type: none"> <li>• Tool promotion of artificial discourse</li> <li>• Structural and temporal disjuncture</li> </ul> Increases <ul style="list-style-type: none"> <li>• Talking about communication</li> <li>• Appreciating time/Recognizing value</li> <li>• Identifying boundary permeability</li> </ul>