

Effects of Students' Identity Salience on Their Attitudes Toward and Experience in  
Face-to-face Peer Collaborative Learning Activities

Feihong Wang

Dissertation submitted to the faculty of the Virginia Polytechnic Institute and State  
University in partial fulfillment of the requirements for the degree of

Doctor of Philosophy  
In  
Curriculum and Instruction

John K. Burton  
Barbara B. Lockee  
Michael A. Evans  
Brett D. Jones

March, 18, 2010  
Blacksburg, Virginia

Keywords: collaborative learning, identity salience

Effects of Students' Identity Salience on Their Attitudes Toward and Experience in  
Face-to-face Peer Collaborative Learning Activities

Feihong Wang

ABSTRACT

This sequential, mixed methods study explored students' attitudes towards collaborative learning and their responses to collaborative learning problems in relation to their identity salience. Identities are motivators of human actions that impact an individual's self-esteem and behavioral tendencies (Stryker, 1968). An individual has three identity aspects that are related to different behavioral tendencies: individual, relational, and collective aspects. The identity aspect that an individual acts out across a variety of situations is their identity salience. Implied by the identity salience theory, students' behaviors may be detrimental or beneficial to the effectiveness of collaborative learning based on their identity salience. Results of the study revealed a possible relationship between students' identity salience and their attitudes, prior experiences, working preferences, and priorities in collaborative learning. In addition, results of the study also disclosed students' behavioral tendencies in dealing with collaborative learning problems including group tension, the free-rider effect, and role taking in relation to students' identity salience. Findings of this study can be used to support further investigations on personalized student grouping for effective collaborative learning.

## Acknowledgements

This document and the work that it reflects are the interwoven efforts of many contributors. I would like to express the deepest appreciation to all those people who have made this dissertation possible and because of whom my graduate experience has been one that I will cherish forever.

First, my deepest gratitude is to my unparalleled advisor, Dr. John K. Burton. I have been amazingly fortunate to have an advisor who gave me the freedom to explore my research interests and, at the same time, the guidance to help me stay on the right track. Dr. Burton has always been supportive: his patience and care helped me overcome many critical moments and finish this dissertation.

My committee was filled with outstanding role models. Dr. Barbara Lockee was also my graduate assistantship supervisor. She has always been nice, patient, and thoughtful. The experience of working with her not only shaped me better academically, but also made me a better person.

I would also like to thank my committee member, Dr. Michael Evans. I was his graduate research assistant for a year to work on a 3-year NSF granted project (NSF 0736151) to design collaborative, co-constructive learning technologies for PreK-3 mathematics classrooms. During that crucial year, I observed how a big research project might be organized and conducted; how research opportunities should be seized; and how interdisciplinary collaboration could be managed.

I am deeply grateful to Dr. Brett Jones who continually and convincingly conveyed a spirit of adventure in regard to research and scholarship, and an excitement in regard to teaching. His insightful comments and constructive criticism at different stages

of my research were thought-provoking and they helped me focus my ideas. I am also thankful to him for helping me develop and finalize part of my survey.

I am grateful to Dr. Jane Falls for her encouragement, practical advice, and carefulness. I am also thankful to her for always being there for me whenever I had problems or down moments in my life.

I am also thankful to my Master's advisor, Dr. Jennifer Brill. She encouraged me to get into the doctoral program. Her motto, "Keep moving like a shark." encouraged me to stick to my goals all through these years.

I am also grateful to the former or current staff at Virginia Tech for their various forms of support during my graduate study.

Many friends have helped me stay sane through these difficult years. Their support and care helped me overcome setbacks and stay focused on my graduate study. I greatly value their friendship and I deeply appreciate their belief in me.

Most importantly, none of this would have been possible without the love and patience of my family. My family, to whom this dissertation is dedicated, has been a constant source of love, concern, support and strength all these years. I would like to express my heart-felt gratitude to my family.

## Table of Contents

Abstract.....	ii
Acknowledgements.....	iii
List of Figures.....	vii
List of Tables.....	viii
Chapter 1: Introduction and Need for the Study .....	1
Statement of the Problem.....	2
Purpose Statement of the Study.....	3
Research Questions.....	4
Organization of the Study.....	5
Chapter 2: Review of Literature .....	7
Introduction .....	7
Collaboration .....	7
Collaborative Learning .....	10
The Theoretical Underpinning of Collaborative Learning .....	13
<i>Mead's social act theory</i> .....	16
Peer Collaborative Learning .....	19
Face-to-face & Technology-Mediated Collaborative Learning.....	21
Advantages and Skepticisms of Collaborative Learning.....	26
Identity .....	28
Psychologists' Approach of Identity .....	29
Sociologists and Social Psychologists' Approach of Identity.....	30
Structure of Identity .....	32
Social Identity .....	33
Three identity Aspects .....	35
Identity Aspects and Motivation .....	36
Identity Saliency .....	36
Identity Saliency and Collaborative Learning .....	38
Research in Identity and Collaborative Learning.....	42
Summary.....	44
Chapter 3: Methodology.....	47
Study Design .....	47
Mixed Methods Research Design.....	49
Survey Instrumentation.....	51
Retrospective Interview.....	53
Interview Protocols .....	54
Research Participants .....	55
Data Collection Procedure.....	55

Data Analysis Techniques.....	56
Summary.....	57
Chapter 4: Analysis of Survey and Interview Data.....	59
Pilot study.....	59
Pilot Study Participants.....	59
Pilot Study Procedure.....	59
Reliability Test of the Survey Questions.....	60
Quantitative Component .....	61
Description of Survey Participants.....	61
Reliability Test of the Survey Questions.....	62
Quantitative Research Question 1.....	62
Power and Sample size.....	67
Reliability Test of the Survey (without Outliers).....	69
Qualitative Component .....	69
Description of Interviewees .....	69
The Outlier and the Extreme Case.....	71
Qualitative Research Question 1.....	72
Qualitative Research Question 2.....	76
Qualitative Research Question 3.....	78
Qualitative Research Question 4.....	80
Qualitative Research Question 5.....	82
Qualitative Research Question 6.....	87
Summary.....	89
Chapter 5: Discussion.....	92
Contributions of This Study.....	92
Discussion of the Findings.....	94
Recommendations.....	98
Areas for Future Investigations.....	102
Study Limitations.....	103
Overall Design Issues .....	104
Phase I survey Limitations.....	104
Phase II Interview Limitations.....	106
Summary.....	108
References .....	109
Appendix .....	128
Appendix A: IRB Approval.....	129
Appendix B: Recruitment Materials.....	130
Appendix C: Survey Instrument.....	132
Appendix D: Interview Protocol.....	138
Appendix E: Consent Form.....	139

## List of Figures

<i>Figure 1: The illustration of the research problem. ....</i>	3
<i>Figure 2: Relational diagram of collaborative learning ....</i>	10
<i>Figure 3: The theoretical axis of collaborative learning ....</i>	14
<i>Figure 4: Relational diagram of identity and identity salience.....</i>	31
<i>Figure 5: Diagram of the research focus ....</i>	46
<i>Figure 6: Procedure of this study design.....</i>	48
<i>Figure 7: The boxplots of participants' attitudes.....</i>	63
<i>Figure 8: The mean plot of participants' attitudes.....</i>	65
<i>Figure 9: Power of the test.....</i>	68
<i>Figure 10: Minimal sample size of the test.....</i>	69

## List of Tables

<i>Table 1.</i> Outcome of the Reliability Statistics for Pilot Study.....	60
<i>Table 2.</i> The Item-Total Statistics for the Six Tested Survey Questions.....	60
<i>Table 3.</i> Gender of Respondents.....	61
<i>Table 4.</i> Age of Respondents.....	62
<i>Table 5.</i> Descriptive Statistics of Participants' Attitudes.....	64
<i>Table 6.</i> The ANOVA Outcomes of Participants' Attitudes between Groups.....	65
<i>Table 7.</i> The Multiple Comparisons of Attitudes between Identity Salience Groups.....	66
<i>Table 8.</i> Interviewees' Reported Attitudes toward Collaborative Learning.....	73
<i>Table 9.</i> Interviewees' Reported Reasons for Their Dislike of Collaborative Learning...	75
<i>Table 10.</i> Interviewees' Reported Experience of Collaborative Learning.....	76
<i>Table 11.</i> Interviewees' Reported Working Preferences.....	77
<i>Table 12.</i> Interviewees' Priorities in Collaborative Learning.....	79
<i>Table 13.</i> Interviewees' Approaches of Dealing with Free Riders.....	84
<i>Table 14.</i> Interviewees' Reasons for How to Deal with Free Riders.....	85

## Chapter 1: Introduction and Need for the Study

Peer collaborative learning that emphasizes collaboration among peers, instead of collaboration between adults and children or experts and novices, has attracted a great deal of interest. Researchers and instructional practitioners have been working on applying this learning approach to improve students' learning in the classroom settings.

Other than proved academic advantages, collaborative learning also faces skepticism for its transient quality (Thomas & Perry, 1998; 2006). Researchers pointed out that not all collaborative learning activities were successful. Many collaborative learning activities failed to generate any collaborative actions (Hardy, Lawrence, & Grant, 2005). The failure of a collaborative learning activity may be attributed to communication problems, group tensions (Smith, 2005), perceived group statues (Barron, 2003; Nuthall, 1999), and social loafing (Salomon & Globerson, 1989). Formally, social loafing is the reduction of individual effort when performing collectively (Karau & Williams, 1993; Latane, Williams, & Harkins, 1979). This phenomenon is often accompanied with the free-rider effect in which one or two students avoid making an effort at group task but take the credit for the group work (Johnson & Johnson, 1993; Karau & Williams, 1993; Slavin, 1990) just like taking a free ride. The free-rider effect may eventually lead a collaborative learning activity to go against its purposes: participating and learning for all group members. This raises a question: why do some students take chances to be free riders while others do not? In some cases, group members who are doing most of the group work start to participate in the group work less to avoid being sucked by those free riders (Johnson & Johnson, 1993; Webb, 1995). Consequently, the collaborative activity collapses.

However, not all students under this circumstance choose to reduce their efforts. This raises another question: why do these students choose to be taken advantage of?

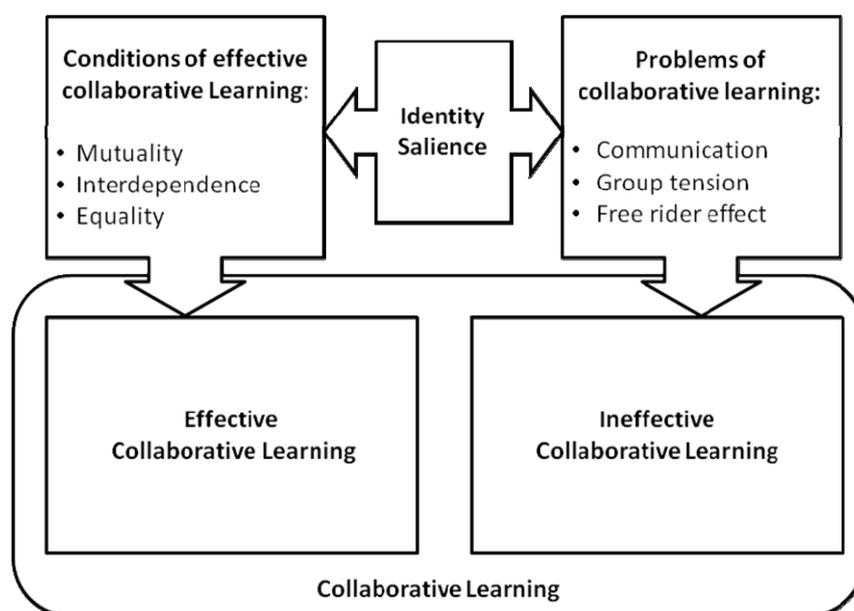
Researchers claimed that effective collaborative learning happened under three distinctive and interrelated conditions: mutuality, interdependence, and equality among group members (Damon & Phelps, 1989; Dillenbourg, Baker, Blaye, & O'Malley, 1996; Granott, 1993; Hardy et al., 2005; Ozmantar, 2005; Slavin, 1996; Suzuki & Kato, 1997). Researchers have pointed out the problems of collaborative learning as well as conditions for effective collaborative learning. However, the fundamental causes of collaboration problems and the motivational factors that contribute to effective collaborative learning have been left mostly untouched. Looking into these questions can help instructional designers and practitioners to diagnose problems of collaborative learning, bypass application pitfalls, and increase effectiveness of collaborative learning activities.

### *Statement of the Problem*

Researchers have started to investigate collaborative learning activities through the prism of identity in recent years. An individual's identity has three aspects: personal, relational, and collective identity (Brewer & Gardner, 1996; Cote & Levine, 2002; Lord, Brown, & Freiberg, 1999; Sedikides & Brewer, 2001). These three aspects are either hierarchically ordered (Stryker, 1968) or only one is activated at a time (Lord et al., 1999). As a result, it creates three types of identity salience: individual, relational, and collective identity salience. An individual's identity salience has potential impact on their motivation, judgment, self-esteem, and behaviors (Benson & Mekolichick, 2007; Breckler & Greenwald, 1986; Brewer & Gardner, 1996; Kashima &

Hardie, 2000; Triandis, 1989). Therefore, students' different identity salience may affect them to behave positively or negatively in collaborative learning activities.

An investigation of peer collaborative learning from the perspective of identity salience may possibly come to the disclosure of factors that support or hinder collaborative learning activities. As illustrated in Figure 1, collaborative learning includes both effective and problematic activities. Identity salience may possibly explain the fundamental causes of the problems in collaborative learning, as well as motivational factors that lead students to meet the conditions for effective collaborative learning. However, a review of literature to date shows there is no research investigating the influence of different identity salience on students' attitudes toward, perceptions of, and behaviors in peer collaborative learning activities.



*Figure 1:* The illustration of the research problem.

#### *Purpose Statement of the Study*

The purpose of this two-phase, sequential, mixed methods study was to obtain

quantitative results from a sample and then follow up with a few individuals from the sample to explore those results in more depth. In the first phase, quantitative research identified the participants' identity salience. In addition, the quantitative research hypothesis addressed the relationship between students' identity salience (relational, collective identity, and individual) and students' attitudes toward the collaborative learning approach. The hypothesis was that students at Virginia Polytechnic Institute and State University with social identity salience (relational and collective identity) would have more positive attitudes toward the collaborative learning approach than students with individual identity salience. In the second phase, qualitative interviews were used to probe students' experience in collaborative learning activities from the perspective of identity salience. The interviews consisted of six students from the individual and relational identity salience groups and five students from the collective identity salience group. The reason for collecting and mixing both quantitative and qualitative data was to bring together the strengths of both forms of research methods in order to have a more complete view of the research questions and findings.

### *Research Questions*

The merging of quantitative and qualitative data happened at all stages of this study, including the design, data collection, data analysis, and interpretation stages. In order to find out how students' experience of collaborative learning was affected by their identity salience, this study was guided by the following research questions:

*Quantitative:* What is the relationship between students' identity salience and their attitudes toward collaborative learning?

*Qualitative Question:* What are students' experiences in collaborative learning in relation to their identity salience?

The six qualitative sub-research questions were:

*Qualitative 1:* What are students' experiences and attitudes toward collaborative learning in relation to their identity salience?

*Qualitative 2:* What are students' collaborative working preferences in relation to their identity salience?

*Qualitative 3:* What are students' priorities in collaborative learning in relation to their identity salience?

*Qualitative 4:* How do students deal with group tension in relation their identity salience?

*Qualitative 5:* How do students deal with the free-rider effect in relation to their identity salience?

*Qualitative 6:* How do students take a specific role (leader, coordinator, and follower) in collaborative learning in relation to their identity salience?

### *Organization of the Study*

Chapter 1 provides background information to the study, statement of the problem, purpose statement of the study, and research questions.

Chapter 2 includes a rich review of the literature related to the study. This chapter includes four major sections. Since this was an interdisciplinary study, the first two sections of this chapter discuss the two different fields. The first section discusses peer collaborative learning. This section includes key definitions and an introduction of collaborative learning, the

aspect of peer collaborative learning in relation to collaboration, the theoretical underpinning of collaborative learning, a discussion of face-to-face and technology-mediated collaborative learning, and the advantages and problems of collaborative learning. The second section provides an overview of the identity salience theory. Within sections one and two, the discussion starts from a general layout of the field to the specific research interests. The third section combines research interests from sections one and two to discuss the interrelationship between collaborative learning and identity salience. In addition, this section also provides rationales for understanding problems in peer collaborative learning from the perspective of identity salience theory. The last section ends with a summary of the literature review.

Chapter 3 provides information related to the methodological approaches that were undertaken to answer the posited research questions. This chapter contains a discussion of the research design, research participants, data collection procedures, research instruments, and procedures for data analysis.

Chapter 4 analyzes the research findings. The discussion of the research findings are organized according the seven research questions.

Chapter 5 discusses the contribution of this study to the field of instructional design and technology, factors for consideration, findings, and recommendations for future research.

## Chapter 2: Review of Literature

### *Introduction*

This study investigated the interrelationship between face-to-face peer collaborative learning and students' identity salience. This chapter is a review of the literature related to the study. To understand how students' behaviors and attitudes may be influenced by their identity salience in a collaborative learning setting, the review of the literature includes two threads. In the first thread, the literature review defines the nature of peer collaborative learning, clarifies the theoretical foundations on which it is based, and concludes the advantages and skepticisms of collaborative learning. In the second thread, the review of literature includes the introduction of identity, identity salience, and research trends in the field of identity. These two threads will be carried out through the mapping out of the specific location of face-to-face peer collaborative learning in relation to collaboration and the location of identity salience in relation to identity. Then these two threads come to the joint point discussing the possibility of using identity salience as a prism to interpret the causes of collaborative learning problems, as well as the motivational factors for successful collaborative learning. This chapter concludes a discussion of this study's focuses in relation to its general academic scope.

### *Collaboration*

Collaboration with others has always been a central form of human activity (Barron, 2000). Collaboration is a type of joint activity, that is, an activity that involves two or more participants in which they assume particular roles, make division of labor, and take coordinated actions to establish and achieve a joint dominant goal (Clark, 1996, 2005). Activities such as a

wedding ceremony, a family dinner, a purchase process, a chess game, and a discourse are all joint activities. Under the broad category of joint activities, collaboration has been defined differently in different time periods by numerous researchers. While some researchers take collaboration as a general category, such as a social structure, others equal collaboration to collaborative learning and define collaboration as an instructional method. For example, Dillenbourg and his colleagues (1996) claim that “collaboration is a social structure in which two or more people interact with each other and, in some circumstances, some types of interactions occur that have a positive effect” (p. 21). According to Gokhale (1995), collaboration refers to “an instruction method in which students work in groups toward a common academic goal” (p. 23). Moreover, some researchers tend to define collaboration more generally such as “collaboration mean working together for a common end” (Fishbaugh, 1997, p. 4), whereas some researchers prefer a more specific definition such as “a coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem” (Roschelle & Teasley, 1995, p. 70). Researchers who emphasize the voluntariness of collaboration defined collaboration as “a style for interaction between at least two co-equal parties voluntarily engaged in shared decision-making as they work toward a common goal” (Friend, 1990, p. 72). Some researchers believe collaboration is an type of activity in which “children work together to complete a single, unified task that represents the shared meaning and conclusions of the group as a unit” (Fawcett & Garton, 2005, p. 158). The various definitions of collaboration indicate that collaboration is actually a general term that can be applied to different situations.

In general, collaboration is divided into two large groups: collaborative work between organizations and collaborative learning between individuals. Specifically, collaborative activities can also be differentiated by using four joint activity variables suggested by Clark (1996): time, scriptedness, formality, and governance.

*Scriptedness* ranges from prepackaged activity such as a graduation ceremony to largely unscripted event such as running into a friend in the street. *Governance* puts participants' equal role on one polar and dominate role on the other. *Time* indicates whether a collaborative activity is a time-bounded event such as a football game, or an ongoing process such as learning.

*Formality* specifies whether a collaborative activity is a highly formal activity such as an in-class learning activity or a very informal activity that would take place after school time.

Johnson and Johnson's (1996) differentiation of formal and informal collaborative learning is different. According to Johnson and Johnson a collaborative learning activity that lasts from one class period to several weeks is formal collaborative learning, while the activity that lasts from a few minutes to one class period is informal collaborative learning. This shows that Johnson and Johnson's differentiation of collaborative learning is actually a further division of the time-bounded collaborative learning activities. In order to distinguish Johnson and Johnson's definition of formal and informal collaborative learning from the formality variable, in this paper, Clark's formality is replaced by academy. That is to say, highly formal activity such as an in-class learning activity is defined as academic activity or use in-class learning activity. This study focused on formal in-class collaborative learning activities.

Using collaboration as the basic category, the discussion of collaborative learning, peer

collaborative learning, and face-to-face peer collaborative learning will be carried out in the following section. Figure 2 illustrates the deductive relationship among these areas.

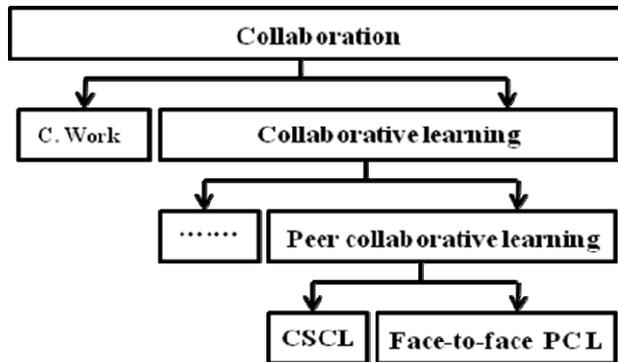


Figure 2: Relational diagram of collaborative learning.

### *Collaborative Learning*

Collaboration has started to gain its attention and prominence in the educational field since the last two decades of the 20<sup>th</sup> century (Dornyei, 1997; Martin, 2007). In the educational realm, collaboration is specified as collaborative learning, that is, as defined by Johnson and Johnson (1996), “the instructional use of small groups so that students work together to maximize their own and each other’s learning” (p. 786). Collaborative learning evolves from the ideas of some psychologists such as David Johnson, Roger Johnson, and Robert Slavin (Alavi, 1994). Similar to the variation of definitions for collaboration, collaborative learning was not a complex and not universally defined concept (Resta & Laferriere, 2007). Although the meaning of collaborative learning was defined or adopted differently by researchers based on their specific perspectives, the fundamental elements of collaborative learning have been kept the same: group based activities, shared academic goals, mutual help, and resource sharing.

Collaborative learning and cooperative learning have been used interchangeably by many

researchers (Aiken, Bessagnet, & Israel, 2005; Sawyer, 2006), while some researchers take them as different learning approaches and claim the necessity of differentiating these two terms. There are three main differences between collaborative and cooperative learning. The fundamental difference is the structure (Dillenbourg, 1999; Johnson & Johnson, 1996; Slavin, 1995, 1997). Cooperative learning requires the division of labor and role taking among participants and the task is split into independent subtasks. Collaborative learning, as John and Johnson (1996) point out, is historically less structured and more student-directed than cooperative learning.

Collaborative learning provides only vague directions to teachers about its use. In a cooperative learning activity, each participant is required to be responsible for a portion of the problem solving, whereas collaborative learning involves the mutual engagement of participants in a coordinated effort to solve problems together (Dillenbourg, 1999; Lehtinen, Hakkarainen, Lipponen, Rahikainen, & Muukkonen, 1999; Roschelle, 1996; Teasley, 1995). Consequently, cooperative learning is normally associated with well-structured knowledge domains, while collaborative learning is associated with ill-structured knowledge domains (Slavin, 1997).

Research on cooperative learning tended to emphasize the importance of individual accountability (Johnson & Johnson, 1986, 1993; Johnson, Johnson, & Scott, 1978; Johnson & Johnson, 1983; Slavin, 1999), while research on collaborative learning focused more on the group as a whole. Individual accountability means “each student is assessed individually concerning their mastery of the concepts and the material involved in the group learning exercises” (Alavi, 1994, p. 165). Secondly, some researchers believe that cooperative learning and collaborative learning differ in their depth of interaction, integration, commitment, and

complexity. When putting cooperative learning and collaborative learning on a continuum measured by levels of these four factors, cooperative learning falls at the lower end of the continuum, whereas collaborative learning falls at the higher end of it (Himmelman, 1996).

Lastly, other than their implicational differences, studies on collaborative learning and cooperative learning tended to use different research methods. Studies on the cooperative tradition tended to use quantitative research methods that focused mostly on students' achievement. Studies on collaborative learning, on the other hand, took, mostly, the qualitative approach by analyzing students' interactions (Panitz, 1996, 1997).

Compared to their differences, similarities between the collaborative and cooperative learning approaches are more obvious. Definitions of collaborative learning and cooperative learning are sometimes hard to distinguish partly because the ambiguity of the meaning of collaborative learning (Johnson & Johnson, 1996). Kirschner (2001) summarized seven shared common elements between collaborative and cooperative learning: 1) learning is active; 2) the teacher is usually more a facilitator than a "sage on the stage"; 3) teaching and learning are shared experiences between teacher and students; 4) students participate in small-group activities; 5) students take responsibility for learning; 6) students reflect on their own assumptions and thought processes through discussing and articulating ideas in a small-group setting; 7) social and team skills are developed through the give-and-take of consensus-building.

In general, both collaborative and cooperative learning involve the instructional use of small groups in which students work together to maximize their own and each other's learning. Therefore, when a study's focal point is rather the interactive group learning than the specific

group learning approaches, it is legitimate to use these two terms without clarifying their differences. This study focused on the group interactive learning in general; therefore, when talking about collaborative learning, it blurred the line between collaborative and cooperative learning and treated them as the same learning approach. Based on the synthesis of various definitions of collaborative and cooperative learning, in this study, collaborative learning was defined as: a type of learning activity in which learners work in groups toward shared academic goals through sharing of resources and knowledge, as well as through constructing new knowledge, skills, and meaning collaboratively. The focus of this study was the time-bounded, unscripted, in-class, formal collaborative learning.

#### *The Theoretical Underpinning of Collaborative Learning*

How learning happens in collaborative learning settings has been interpreted by different learning theories. Most studies and literatures on collaborative learning take constructivism, especially theories from Piaget and Vygotsky, as the theoretical underpinning of collaborative learning (Dillenbourg et al., 1996; Fawcett & Garton, 2005; Tudge, 1992) because of its focus on making of meaning through the social interaction (John-Steiner & Mahn, 1996). However, collaborative learning, as a learning process, is not sufficient to be interpreted only by the constructivist perspective. In addition, different theories see a same learning process differently by interpreting it from their own perspectives. The fable “The Blind Man and the Elephant” is a right metaphor for this phenomenon. In the fable, seven blind men were feeling an elephant. Because each of them only felt a part of the elephant, their interpretations of an elephant were limited to the part of the elephant they felt. For example, the blind man who felt the tail of the

elephant claimed that an elephant was like a rope. Each learning theory is a blind man feeling only a part of the elephant (collaborative learning) and tells the part of the truth based on its own limited feeling. Although none of them is wrong, none of their interpretations is complete either.

Researchers' use of learning theories to interpret learning in a collaborative learning activity has two main trends: one focuses more on individual cognitive development and the other focuses more on the group development as a whole (Dillenbourg et al., 1996; Thomson, 2006). Dillenbourg and his colleagues (1996) proposed a theoretical continuum ranging from the pole of individual to the pole of group to organize theoretical foundations for collaborative learning. Developed from their work, Figure 3 illustrates the theoretical axis of collaborative learning.

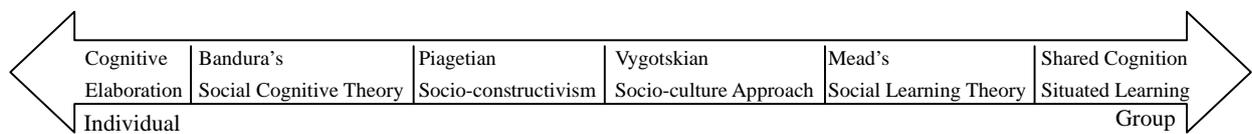


Figure 3: The theoretical axis of collaborative learning.

*Cognitive elaboration perspective* suggests that providing explanation in collaborative learning has the self-explanation effect (Chi, Bassok, Lewis, Reimann, & Glaser, 1989; Slavin, 1996). Explanation providing, in their perspectives, is a cognitive restructuring and elaboration process that could help learners to understand information better and hold it longer.

Bandura's (1977) *social cognitive theory* proposes observational learning: learning through imitation. From this perspective a collaborative activity provides learners with an ideal setting to learn from other group members through observing and imitating their strategies and behaviors (Webb, 1995).

*Socio-constructivist approach* is based on the work of Piaget. Piaget and his followers believe that the social interaction prod cognitive development by initiating critical cognitive conflicts that happen when there are different perspectives among participants (Damon, 1984; Piaget, 1959). In a collaborative activity, the perturbing feedback provided by the peer interaction could initiate a process of intellectual reconstruction in students.

*The socio-cultural approach* is influenced by Vygotsky. This approach emphasizes the processes of the group interaction rather than educational outcomes (Dillenbourg, 1999; Sawyer, 2006). According to Vygotsky (1978), an individual's cognitive system is a result of communication within social groups and cannot be separated from the social life. Students in a collaborative learning activity can benefit from one another by internalizing the cognitive process implicit in their interactions and communications. Nattiv (1994) found that giving explanation and receiving explanation were positive correlate with students' achievement in collaborative learning.

*Social act theory*, founded by Meed, tends to analyze human experience from the standpoint of social process in term of communication instead of individual psychology (Cronk, 2005). This theory take social group life as the essential condition for the emergence of consciousness, the mind, and the conception of self (Mead, 1934).

The concept of *shared cognition theory* is deeply intertwined with the situated cognition theory (Dillenbourg et al., 1996), which focuses on the social characteristics of human learning. This theory claims that learning is the process of participation in community of practice or the process of formation of one's identity in the community (Suzuki & Kato, 1997). From this

theory's perspective, a collaborative learning activity can be viewed as the process of building and maintaining a shared conception of a problem (Roschelle, 1996).

*Social interdependence theory* was founded by Kurt Lewin (Johnson & Johnson, 1996; Johnson, Johnson, & Stanne, 1989; Panitz, 1996). According to this theory, social interdependence will be achieved when individuals share common goals and each person's success is affected by the actions of the other. Because this theory focuses on the essential condition of collaborative learning instead of how learning happens in collaborative learning, it is not included in the continuum.

On one hand, although these theories view learning differently, these alternative perspectives on collaborative learning should be seen as complementary instead of contradictory. Learning in a collaborative activity may happen through students' mutual help and sharing of knowledge (Vygotsky, 1978), cognitive conflicts arise from discussions (Piaget, 1937), the process of explaining and receiving explanations (Chi et al., 1989; Nattiv, 1994; Webb, 1984), observing other participants' behavior (Bandura, 1977), and assuming a certain identity (Mead, 1934). Some of them may happen in one activity and some may not, based on the activity design, group setting, the learning context, and learners' characteristics. On the other hand, for a specific study, focusing on all the learning aspects is impractical. Therefore, for a particular study on collaborative learning, the main learning theory (ies) that the study is based on should still be specified.

*Mead's social act theory.* Taking all the theories as the theoretical underpinning for collaborative learning, this study attached specific importance to Mead's social act theory for it

covers both research variables of the study: identity and collaborative learning. Mead's social act theory is a subdivision of the social learning theory that considers people learn from one another and learning as a result of social interactions (Khan & Cangemi, 1979; Ormrod, 1999).

According to Mead (1934), social group life was the essential condition for the emergence of consciousness, mind, and the conception of self. Researchers have indicated that Vygotsky's theory shares commonalities with Mead's ideas. Valsiner and Veer (1988) claimed that although Vygotsky and Mead did not directly influence each other, their intellectual roots were similar because both of them were strongly influenced by works from Pierre Janet and James Mark Baldwin. Glock (1986) pointed out that Mead and Vygotsky shared the same views on the relationship between the social genesis of the self, the process of internalization, and the genesis of linguistic meaning. Three of Mead's main ideas are closely related to this study: the social interaction, the social act, and the self.

The social interaction is a fundamental element of collaborative learning, while social act is the general category that collaborative learning belongs to. According to Mead, the social interaction or communication was the specific social process where the mind and self arose. In collaboration, interaction refers to personal communication (Mead, 1934; Oxford, 1997) or organization of conversation (Alterman, 2007) such as discussion, explanation and so on. As Alterman and Garland (2000) pointed out, communication was the central mechanism for establishing and maintaining collaboration. Mead identified two forms of interactions: the non-symbolic interaction and the symbolic interaction. Language, in Mead's view, is communication through symbols. Research conducted by Teasley (1995) indicated the

importance of the active symbolic communication between peers for the success of a collaborative learning activity. In that study, most groups that did not have the opportunity to communicate with peers failed to generate even a general hypothesis for their task problem. Johnson and Johnson (1986) also emphasized the importance of the non-symbolic communication such as eye contact for effective collaborative learning.

Mead used the term “social act” to refer to the collective form of actions that were constituted by fitting together lines of behaviors of separated participants. It has the similar meaning to the concept of joint activity. Language using such as making requests, assertions, and debate, are illustrations of social act (Blumer, 1966). In a collaborative learning activity, in order to accomplish the task collaboratively, participants must identify the necessity of collaboration, interpret other participants’ ideas and perspectives, and orient their behavior to coordinate with others toward their joint goal. Therefore, a collaborative activity is a social act/joint activity. According to Mead (1934), social acts arranged from collaboration between individuals to alignment of the acts of organizations or institutions. That is to say, Mead’s joint act literally means collaboration.

Mead’s theory of the emergence of consciousness and self /identity was composed of two related insights. Firstly, Mead defined consciousness as becoming an object to oneself (Gillespie, 2005). Mead (1934) separated “I” from “me”. “I” was a person’s subjective self, while “me” was an object to a person. The separation enabled individuals to make themselves the object of their own attention (Martin, 2007). By doing so, an individual could reflect on himself (Martin, 2007) as well as interacted with himself such as receiving himself, having conceptions of himself,

communicating with himself, acting toward himself, and addressing himself (Blumer, 1966). Mead believed that the “I” and “me” relationship serves as the mechanism by which a person related to the society (Valsiner & Veer, 1988). Secondly, according to Mead (1934), self arose dynamically in the process of social activities instead of being a fixed property gained at birth. An individual’s identity was resulted from an individual’s relation to the social environment as well as to other individuals within it. The social environment could be a culture, a nation, a community, or a group that an individual was committed to. For example, a student in a class without collaborative activities might not have the identity of a collaborator. Later, when the student enrolled in a class that had a lot of collaborative activities, he might gradually develop the identity of a collaborator. In collaborative learning activities, students’ interactions would affect students’ perception of self. Research has demonstrated that collaborative activities influence participants’ sense of self. For example, Suzuki’s (1997) study recorded a student’s on-going identity formation and the transformation of identity from a non-programmer to a programmer in a collaborative group. This study, on the contrary, focuses on how students’ identity will affect a collaborative activity.

In sum, although Mead’s social act theories did not use the specific term “collaborative learning”, it defined collaborative learning in general, pointed out the essential factor of collaborative learning (social interaction), and naturally integrated the identity theory to the discussion of collaborative learning.

### *Peer Collaborative Learning*

Collaborative learning includes both symmetric and asymmetric group organizations in

term of participants' level of competence. Collaborative learning between instructors and students or senior students and junior students are examples of asymmetric collaborative learning. In the asymmetric setting, the participants either take turns advising each other or the expert gives advice to the less knowledgeable participants all through the activity. The information flow in this type of collaborative learning approach is comparatively unilateral (Fishbaugh, 1997; Granott, 1993). Some articles use homogeneous and heterogeneous instead for the same meaning (e.g., Cohen, 1994; Dillenbourg et al., 1996; Gokhale, 1995; Good, Mulryan, & McCaslin; Johnson & Johnson, 1996; Oxford, 1997), though, heterogeneous grouping also means mixed genders, ages, or cultures.

Peer collaborative learning, on the contrary, is a symmetric collaborative learning approach. It is a type of learning activity in which students with similar levels of competence share their ideas in order to solve jointly a challenging learning task that cannot be accomplished on their own (Damon & Phelps, 1989; Fawcett & Garton, 2005; Goos, Galbraith, & Renshaw, 2002). This approach is similar to the teaming collaborative learning model from Fishbaugh (1997) and mutual collaborative learning model from Granott (1993). As far as students' background, prior knowledge, and individual strength and weakness are concerned, no two students' academic competence or capabilities are identical; therefore, peer collaborative learning mostly indicates collaborative learning activities consist of participants at the same academic level. For example, students in the same class or grade at K-12 level are assumed to have similar academic competence. As to the graduate level classes, since they normally do not have level differences, and first year and third year graduate students can enroll in the same class,

collaborative learning activities that are participated only by graduate students are also categorized as peer collaborative learning activities.

Most collaborative learning studies, today, focus on classroom based collaborative learning activities or, in other words, peer collaborative learning activities (Ocker & Yaverbaum, 2001). Researchers claimed that peer collaborative learning had a deeper collaboration than asymmetric collaborative learning (Fishbaugh, 1997; Granott, 1993) because the peer collaborative learning environment provides students with a free and open forum to facilitate the active and productive exchange of ideas (Driscoll, 2000). In such an environment, students can communicate at the level where they can easily understand each other and communicate in the fashion that largely exclude the pressure from the authorities (Damon, 1984; Damon & Phelps, 1989). Therefore, in peer collaborative learning activities the information generally goes two directions, and participants tend to share information and resources. In addition, peer collaborative learning has also proved to be the most effective peer-based learning approach among its kind (Damon & Phelps, 1989).

#### *Face-to-face & Technology-Mediated Collaborative Learning*

The crux of collaborative learning is the participants' interaction (Dillenbourg et al., 1996; Gee & Green, 1998; Ikpeze, 2007; Lipponen, Hakkarainen, & Paavola, 2004; Sawyer, 2006; Webb, 1984). In order to work collaboratively to accomplish a task, learners need to understand the nature of the task together as well as each other's ideas about the task. Consequently, students are faced with challenges of establishing common references, resolving discrepancies in understanding, negotiating issues of individual and collective actions, and coming to a joint

understanding or the common ground (Miyake, 1986; Roschelle, 1992). In order to establish the common ground (Roschelle, 1992, 1996), students must organize themselves to engage in coordinate activities through communication (Barron, 2000). As Alterman and Garland (2000) pointed out, communication is the central mechanism for establishing and maintaining collaboration. Therefore, the communication techniques become one of the elements that differentiate collaborative learning approaches.

Face-to-face peer collaborative learning is the traditional approach of collaborative learning. Most early studies on collaborative learning referred to face-to-face collaborative learning. Research on face-to-face collaborative learning covered a wide range of disciplines including second language learning (Dornyei, 1997), sciences (Harskamp & Ding, 2006; Roschelle, 1996), mathematics (Barron, 2003; Summers, Beretvas, & Gorin, 2005), health education (Mitchell, Johnson, & Johnson, 2002), arts and music (Damm, 2006), and so on. The participants included K-12 students (Summers et al., 2005), college students (Schamber & Mahoney, 2006), graduate students (Ikpeze, 2007), and students with disabilities (McLaren, Bausch, & Ault, 2007). In face-to-face collaborative learning, besides direct verbal communication, students' facial expressions and hand gestures also provide important backchannels that create a sense of awareness and involvement within the group. Visual cues such as lip motions and object pointing, as well, help to convey a speaker's ideas to the listeners (Brennan, 1990). Advocators of the face-to-face collaborative learning approach claimed that these visual cues could make communication and collaboration easier than through media (Agrawala, Beers, Frohlich, & Hanrahan, 1997). For example, Ocker and Yaverbaum (2001)

found that students preferred the traditional face-to-face collaborative learning approach than technology-mediated collaborative learning. Students reported enjoying more as well as having higher quality when collaborated through face-to-face mode than the technology-mediated asynchronous mode.

On the other hand, with the quick development of the educational technologies, collaboration through media has been gaining more and more emphasis and attention. Technology brings multiplicity to the collaborative communication. Changes of communication technologies (e.g., paper, TV, computers) influence what messages can be produced (e.g., text, audio, video), and how interactively meanings can be established and transferred (e.g., synchronously, asynchronous) (Pea, 1994). Although a variety of technologies may be used to support collaborative learning, technology-mediated/supported collaborative learning, today, mainly refers to computer-supported collaborative learning (CSCL) because of the quick advancement and spread of computer technologies in the educational field. Research in the area of CSCL was stimulated by the educational possibilities of computer support cooperative work (CSCW), which was founded on the notion that computers could be used to facilitate, augment, and even redefine interactions between members of a work group (Koschmann, 1994). The focus of CSCL is using computer technologies to facilitate the sharing and creation of knowledge and expertise through peer interaction and group learning processes. CSCL stresses collaboration between students in which the learning takes place through peer interactions. In other words, CSCL has been developed with the intention of supporting peer collaborative learning (Resta & Laferriere, 2007). For example, a virtual learning environment such as Second Life can be used

for different purposes; however, only when students interact and learn collaboratively in the virtual environment can this learning approach fall into the category of CSCL. The integration of computer technology into CSCL can take different approaches. It can take the form of online communication, face-to-face collaboration with the support of computer (Stahl, Koschmann, & Suthers, 2006), and blended learning approach (combine face-to-face and online interaction) (Resta & Laferriere, 2007). The online communication approach or collaboration through computers (Johnson & Johnson, 1996) refers to collaborative learning through the use of networks. The rapid expansion of computer network technologies such as email, blog, wiki, bulletin board, and instant messenger allow students all over the world to create shared space to communicate synchronously and asynchronously on the computer screen. In the face-to-face collaboration with the support of the computer approach (collaboration around computers) (Johnson & Johnson, 1996), a computer can support collaborative learning by providing students with points of shared reference (Johnson & Johnson, 1996) including demonstrating or simulating scientific models, sharing interactive representations, browsing through information on the Internet (Stahl et al., 2006) and so on.

Advocators of CSCL tried to prove that CSCL could mirror the effectiveness of face-to-face collaborative learning (Smith, 2005) or better than face-to-face collaborative learning. Comparison studies on face-to-face collaborative learning versus CSCL got opposite findings. Some of them favored face-to-face collaborative learning (e.g., Ocker & Yaverbaum, 2001), while others favored CSCL (e.g., Pinsonneault & Kraemer, 1989). In general, studies found both CSCL and face-to-face collaboration could be effective (e.g., Anderson, Sanford,

Thomson, & Ion, 2007; Benbunan-Fich & Hiltz, 1999; Tutty & Klein, 2008). Resta and Laferriere (2007), based on reviewing the research on CSCL conducted in the last 20 years in higher education, suggested that “CSCL studies should focus less attention on the question of whether computer-supported collaborative learning is better than face-to-face collaborative learning, but rather focus on what is uniquely feasible with new technology” (p. 69).

Whether CSCL is more effective than or as effective as face-to-face collaborative learning is an unanswerable question, because the technology brings in a new variable to the equation. The positive effects may result from the affordance of the software, the hardware, or the delivery mode that are inherent in a specific instructional program that cannot be generated to all CSCL activities. On the other hand, the effectiveness of CSCL may also vary greatly owing to the differences of students’ computer proficiency. Therefore, when exploring fundamental elements of collaborative learning, face-to-face collaborative learning may be a more appropriate approach.

In order to avoid technology relevant variables such as technology affordance and technology efficacy of students, this study focused only on face-to-face peer collaborative learning. The face-to-face collaborative learning with the support of computers will not be excluded from this study for two reasons. First, for college and graduate level, computers have become an indispensable integration of students’ study, students using the Internet to gather information or using software such as Microsoft Office to organize and present their work. Second, when students collaborate around computers, the interaction and collaboration between students still happens mainly through the face-to-face mode.

### *Advantages and Skepticisms of Collaborative Learning*

Collaborative learning is claimed to be able to help students accomplish tasks that cannot be accomplished individually because it leverages the difference between participants (knowledge, skills, and resources), as well as creates the circumstance for participants to help each other (Hardy et al., 2005) and co-construct knowledge (Vygotsky, 1978). Advantages of collaborative learning include the potential to increase learners' motivation and engagement (Barron, 2000; Bruffee, 1999; Shibley & Zimmaro, 2002), to build social environments for small interdependent groups to co-construct knowledge (Vygotsky, 1976), to catalyze the development of students' critical thinking (Gokhale, 1995; Johnson et al., 1989; Waite & Davis, 2006), problem-solving skills (Lochhead, 1985; Miyake, 1986; Schamber & Mahoney, 2006; Slavin, 1999), and creative thinking (Johnson et al., 1989), to improve learners' social skills (Damon, 1984) and perspective taking ability (Johnson et al., 1989), and eventually to improve learners' accomplishments and retention (Alavi, 1994; Barron, 2000; Johnson et al., 1989; Slavin, 1990). Alavi (1994) suggested that the collaborative learning approach includes three attributes of effective learning process: active learning and construction of knowledge, teamwork in learning, and learning via problem solving.

Although most studies have proved the positive effects of the collaborative learning approach (Dillenbourg et al., 1996), not all collaborative learning activities were successful. Many collaborative groups were ineffective and failed to generate any collaborative action, and some were even destructive (Hardy et al., 2005; Johnson & Johnson, 1996). Researchers criticized the transient quality of the collaborative learning approach (Thomson, 2006) and

pointed out that “collaboration is like cottage cheese. It occasionally smells bad and separates easily” (Thomas & Perry, 1998, p. 409).

Because the increasing pervasion of the collaborative learning approach in today’s education realm, it becomes more and more important to determine the demotivating factors of this learning approach in addition to its motivating factors. Researchers indicated that the failure of collaborative learning activities was mostly attributed to participants’ communication problems, perceived group statuses (Barron, 2003; Nuthall, 1999), effort-avoidance/social loafing (Salomon & Globerson, 1989), and the consequent group tensions (Smith, 2005). Researchers also pointed out that putting students together and telling them that they were a group could not ensure the happening of collaborative learning (Johnson & Johnson, 1996; Slavin, 1999). The accomplishment of effective collaboration depends on the leverage of participants’ differences, the balance of participants’ different concerns (Hardy et al., 2005), and the achievement of intersubjectivity and common ground between participants (Ozmantar, 2005; Tudge, 1992). Intersubjectivity is the status of a shared understanding among group members (Bober & Dennen, 2001; Davidson, 1992; Dennen & Wieland, 2007; Fawcett & Garton, 2005; Summers et al., 2005). To this end, researchers claimed three distinctive and interrelated conditions for effective collaborative learning: group members’ mutuality, positive interdependence, and equality (Damon & Phelps, 1989; Dillenbourg et al., 1996; Granott, 1993; Hardy et al., 2005; Ozmantar, 2005; Slavin, 1996; Suzuki & Kato, 1997).

Positive interdependence is achieved when participants feel responsible for one another’s learning and believe that their goals can only be attained when their team members also attain

their goals (Alavi, 1994; Deutsch, 1962; Johnson & Johnson, 1996; Soller, 2001). In other words, interdependence indicates the necessity of group members' reliance on each other to accomplish their shared goals. The sense of interdependence leads to promotive interaction in which participants encourage and facilitate each other's efforts to complete tasks in order to reach the group's goals (Johnson et al., 1989) through sharing of resources, information, and knowledge. Mutuality is concerned with a reciprocal bilateral communication amongst team members (Goos et al., 2002). Equality means each participant takes other group members' perspectives and directions rather than a unilateral flow of direction (Damon & Phelps, 1989).

Although researchers have pointed out the problems and conditions regarding collaborative learning, it is a comparative passive remedial approach. The fundamental causes of collaboration problems and motivational factors that contribute to effective collaborative learning have been left mostly untouched. Looking into these questions can help instructional designers and practitioners diagnose collaborative learning problems, bypass pitfalls, and increase effectiveness of collaborative learning activities.

### *Identity*

As Buckingham (2008) pointed out "identity is an ambiguous and slippery term" (p. 1). There are various assumptions and definitions of identity based on disciplinary paradigms from which they are derived. For example, Burke and Tully (1977) defined identity as a set of "meanings" applied to the self in a social role or a specific social situation. Gee (2000) referred to identity as "being recognized as a certain 'kind of person' in a given context" (p. 99). Holland, Lachicotte, Skinner, and Cain (1998) suggested that identity defined who a person was and who

the person was not. Within various disciplinary paradigms that have been studying identity such as psychology, sociology and social psychology, political science, and history; psychology and sociology (or social psychology) are the two main contributors of this field.

### *Psychologists' Approach of Identity*

Psychologists are interested in what happens to individuals and what happens “inside” individuals. Psychologists have been studying mental processes that relate to individual actions for a long time (Cote & Levine, 2002). Erikson is one of the most renowned identity theorists in the psychological camp. He started establishing the psychological tradition of identity theory in the 1950s (Mead, 1934; Schwartz, 2001). Erikson’s writings in the 1940s and 1950s greatly contributed to the development of the concept of identity (Cote & Levine, 2002).

Identity formation has been a big topic in the psychological tradition of identity study since the beginning of this tradition. According to Erikson, identity could be best represented in the form of a bipolar dimension ranging from the pole of identity synthesis to the pole of identity confusion. Identity synthesis represents a sense of “a present with an anticipated future” (Erikson, 1968, p. 30), whereas identity confusion represents an inability to develop a workable set of ideas on which to base an adult identity. Each individual should be able to be placed at a certain point between these two poles at any time during their lives (Schwartz, 2001). Built on Erikson’s ideas of the identity dimension, James Marcia (Marcia, 1966) proposed two independent variables: commitment and exploration. Commitment represents the adherence to specific set of goals, values, and beliefs (Marcia, 1988), while exploration refers to a period of engagement in choosing among alternatives (Marcia, 1966; Rogow, Marcia, & slugoski, 1983) or

“problem-solving behavior aimed at eliciting information about oneself or one’s environment in order to make a decision about an important life choice” (Grotevant, 1987, p. 204). By dividing exploration and commitment into low and high levels and juxtaposing each level of one with each level of the other, these two variables comprise four identity statuses: identity diffusion, identity foreclosure, identity moratorium, and identity achievement (Marcia, 1966). Identity diffusion is the state that represents the relative lack of both exploration and commitment. This status is similar to Erikson’s identity confusion. Identity foreclosure is the state of having made commitments to a set of goals, values, and beliefs in the relative absence of exploration. Identity moratorium is the state of active exploration in the relative absence of commitment. Identity achievement symbolizes an enacted commitment following a period of exploration (Schwartz, 2001).

#### *Sociologists and Social Psychologists’ Approach of Identity*

In the sociology realm, the root for the concept of identity can be traced back to the early sociological interests in “self and society” (Cote & Levine, 2002). The sociologists’ approach of identity study is different to the psychologists’ approach. While the psychologists of identity focus on internal personal conflicts through studies on youth identity formation and identity statuses, sociologists emphasize the significance of social context in the identity formation (Buckingham, 2008). That is to say, sociologists’ interests are more in the social uncertainties that people face than the internal conflicts people may go through. Sociologists believe that identity is essentially a social and historical construct, and identities exist only when people participate in structured social relationships (Stryker, 1968). The sociologists’ approach of

identity studies have been focusing on social structures and related individual actions. The essential focus of collaborative learning is the social interactions within a learning group; therefore, the sociologists' tradition of identity concepts and studies are more appropriate for studies that explore collaborative learning from the perspective of identity.

Using the sociologists' tradition of identity concept as the basic category, the discussion of the identity structure and identity salience will be carried out in the following section. Figure 4 illustrates the relationship between identity, identity structure, and identity salience. From the sociologists' point of view, identity includes both social and personal aspects, and the social aspect can be further divided into relational and collective identity. Therefore, an individual's identity includes three aspects: individual, relational, and collective identity. The hierarchical organization of these three aspects of identity determines that, for an individual, one of these three aspects will take the prominent position, that is, this person's identity salience. Three identity aspects can possibly construct three types of identity salience: individual, relational, and collective identity salience.

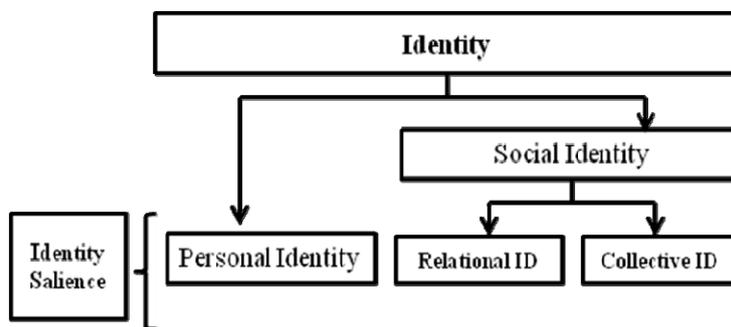


Figure 4: Relational diagram of identity and identity salience.

### *Structure of Identity*

Identity is multifaceted and dynamic (Brewer & Gardner, 1996); and it should be viewed as an organized structure instead of a fixed unity (Stryker, 1968). The crux of social identity theory is the notion that individuals' identities contain both personal and social components (Banaji & Prentice, 1994; Bettencourt, 1999; Cote & Levine, 2002; Fearson, 1999; Turner, 1982). According to James (1907, 1980), the major constitutions of self were empirical self ("me") and the pure ego ("I"). The empirical self ("me") is a tripartite that includes the material self, the social self, and the spiritual self. The material self is one's body, clothes, family, home, and possessions. Social self involves how one is seen and responded by others. The spiritual self is one's inner thinking and feeling of self. The pure ego ("I") was the subjective synthesis of the stream of thought that was different at each instant that functions consciously and objectively to connect the various empirical self (Levin, 1992). The empirical self feature of the self is stable, harmonious, and continuous in the sense that all changes are gradual (James, 1980). According to Mead (1934), the self was the result from an individual's relation to the social environment as a whole and to the other individuals within it. Mead had a similar idea of structure of identity to James. Mead also separated "I" from "me". The "me" is the socialized aspect of a person. It serves as an object to a person to enable the person to reflect on himself (Martin, 2007), interact with himself, have conceptions of himself, communicate with himself, act toward himself, and address himself (Blumer, 1966). Since "I" is subjective and may vary directly in line with the contemporary environment and immediate social context, it is similar to the concept of self image (Turner, 1982). "Me", the socialized aspect of a person, is the identity that the sociologists normally refer to. Similar to James and Mead's subdivision of "me", Burke (2003) suggested that

the structure of identity included social identity, role identity, and personal identity. Shared among these sociologists' definitions of identity structure is that identity is not a fixed unit but with aspects. The individual traits and identity aspects gained from the process of the social interaction are two dispensable aspects of an individual's concept of self. This division is also consistent with the inherent meaning of the term "identity", which indicates two aspects: something unique and consistent to an individual as well as the relationship with a broader collective or social group of some kind (Buckingham, 2008). Gergen (1971) further specified the structure of identity by identifying them as two main classes of self-conception. The first class was an individual's membership of various formal and informal social groups such as nationality, political affiliation and so on. The second class was an individual's specific personal attributes such as feelings of competence, attributes, characteristics, personal tastes and so on. Turner (1982), later, redefined these two classes of self-conception as two relatively separated subsystems: personal identity and social identity. He argued that social and personal identity were cognitive structures that together account for the self-concept. Fearson's (1999) analysis of social science literature also suggested there were two aspects of self: personal and social identity. Bettencourt's (1999) study validated this division by showing that the cognitive representations of social identity were different from that of personal identity. In sum, an individual's structure of identity includes two major aspects: individual and social identity.

### *Social Identity*

Social identity is a theory formed by Henri Tajfel and John Turner (Bettencourt, 1999; Ellemers, Kortekaas, & Ouwerkerk, 1999). Social identity theory was based on the concept that

social identity was “part of an individual’s self-concept which derives from his knowledge of his membership of a social group (or groups) together with value and emotional significance attached to that membership” (Tajfel, 1978, p. 63). This definition was derived from Tajfel and Turner’s early seeking to differentiate identity elements that derived from individual personality traits and interpersonal relationships (personal identity) and identity elements that derived from group belonging (social identity) (Tajfel & Turner, 1979). Turner (1982) concluded that social identity was the sum total of the identification of social categorization that a person used to define himself. Because of social identity’s inherent focus on the relationship between the social process and the identity, identity studies in this field focused more on group activities such as collaborative learning activities. As Turner (1982) claimed, social identity processes were fundamental for understanding group behavior. Tajfel postulated that social behavior existed both on the interpersonal and intergroup level (Tajfel & Turner, 1979). On one hand, social identity is a social process in which the individual and the social are inextricably related (Jenkins, 1996). On the other hand, the individual’s self-concepts do not vary directly according to the contemporary environment and immediate social context at any given moment as self image. The self image of an individual may vary directly in line with the contemporary environment and immediate social context, whereas the cognitive structure of social identity is comparatively stable (Turner, 1982). For example, a female can constantly change her self- image as a mother, a career woman, or a daughter depending on where and with whom she is; however, the cognitive representations of social identities such as being an American include the sense of involvement, concern, pride, and other emotions in group activities (Brewer, 1991), which are comparatively

stable.

### *Three Identity Aspects*

The present concept of the three identity aspects relies heavily on Kashima (1995) and Brewer and Gardner (1996). Brewer and Gardner's (1996) article, "Who is this 'We'" is considered, by some researchers, a major breakthrough in identity aspect study (Kashima & Hardie, 2000; Sedikides & Brewer, 2001; Sluss & Ashforth, 2007). Instead of defining social identity based on membership in social groups and taking interpersonal relationships as personal identity (Tajfel, 1978; Tajfel & Turner, 1979), Brewer and Gardner and their followers described two levels of social identity: "those that derive from interpersonal relationships and interdependence with specific others and those that derive from membership in larger, more impersonal collectives or social categories" (Brewer & Gardner, 1996, p. 89). Therefore, they suggested that social identity could be further divided into relational identity and collective identity (Brewer & Gardner, 1996; Kashima & Hardie, 2000; Lord, Brown, & Freiberg, 1999; Sluss & Ashforth, 2007). Relational identity generally refers to an individual's sense of self in terms of his power, entitlement, and social affiliation in relation to others (Holland et al., 1998). It is derived from the connections and role relationships with significant others such as relationships between children and their parents, students and their teachers, and employees and their bosses (Brewer & Gardner, 1996; Lord et al., 1999). In a group setting, relational identity refers to an individual's apprehension of his social position in the group derived from ties with other group members (Kashima & Hardie, 2000; Ozmantar, 2005). The idea of collective or group identity addresses the "we-ness" of a group and stresses the similarities and shared

attributes of group members (Hardy et al., 2005). Given together, the three identity aspects theory claims that an individual's self-conception is composed of three aspects: individual, relational, and collective identity.

#### *Identity Aspects and Motivation*

Identities are motivators of human actions (Stryker, 1968). Different aspects of identity are associated with different social motivations and implications for an individual's self-esteem and behavioral tendencies (Triandis, 1989). Understanding the nature of divergent identity aspects allows researchers to better interpret a student's behavior, cognition, emotion, and motivation in a group activity (Markus & Kitayama, 1991) or, to be more specific, in a collaborative learning activity. The individual aspect of identity focuses on oneself as a unique being. The basic motivation is personal self-interest. The relational aspect of identity is characterized by mutual concern for the interests and outcomes of the other. It focuses on one's role-related relationships and the self-worth is derived from the appropriate role behavior. The basic motivation for collective identity is the welfare of the group as whole, which places a premium on the common fate, group cohesion, and group norms (Brewer & Gardner, 1996; Kashima & Hardie, 2000; Lord et al., 1999).

#### *Identity Salience*

Stryker and Burke's identity theory suggests that an individual's identity has multiple role related identity components. These components are organized in a hierarchical order, and they should not be at the same salient level at any given time, otherwise it would result in distress and conflicts (Burke, 2003; Stryker, 1968; Stryker & Burke, 2000). Combining Stryker and Burke's

identity theory with the three identity aspect theory, it suggests that three identity aspects are organized in a hierarchical order (Brewer & Gardner, 1996; Sluss & Ashforth, 2007). Lord, Brown and Freiberg (1999) suggested that there were inhibitory relations among identity aspects in that activating one identity aspect might inhibit the activation of the alternative identity aspects. Although these two trends of ideas share subtle differences, they all agree that only one identity aspect takes the dominant position for a person in a given situation. In other words, people have identity salience.

The theory of identity prominence/salience among the three identity aspects was also put forward and studied by some other researchers (e.g., Kashima & Hardie, 2000; Kashima et al., 1995) Identity salience defines the probability and readiness of acting out an identity across a variety of situations, or alternatively across persons in a given situation (Stryker & Burke, 2000; Stryker & Serpe, 1994). The root of identity salience theory can be traced back to George Herbert Mead's work in 1930s in which a formula is asserted: "Society shapes self shapes social behavior" (Stryker & Burke, 2000).

The integration of the three identity aspects theory and the identity salience theory makes three different types of identity salience: individual, relational, and collective identity salience (Brewer & Gardner, 1996; Kashima & Hardie, 2000; Sluss & Ashforth, 2007). On one hand, an individual's identity salience is viewed as trans-situational and stable across time and situation (Stryker & Burke, 2000; Stryker & Serpe, 1994). For example, a person who has the relational identity salience tends to constantly care about his relation with other people in different groups. A mismatch or discrepancy of an individual's identity salience results in negative emotion

(Stryker & Burke, 2000). On the other hand, the salience of each aspect of identity is, to some extent, context reliant (Burke & Tully, 1977). When facing an overpowering situation, an individual may adjust the identity salience temporarily. For example, when collaborating with a teacher, a student will care more about his relationship with the teacher (relational identity salience). Therefore, even if he has individual identity salience in most other circumstances, he may give it up to relational identity salience in this situation. Take the 2008 Beijing Olympic open ceremony for another example. Many acts required about two thousand performers to coordinate to perform. Performers were required to perform exactly the same at the same time or stand at certain positions to compose an image. Every individual performer faded into the background of the show as a whole. No matter what identity salience the performers had in other social contexts, in order to make a perfect show, only the collective identity held its prominence during the performance. The change of identity salience because of the unbalance of individual power is temporary. It may happen in an asymmetric collaborative group; however, in peer collaborative learning settings, since there is not distinctive power weight differences among students, students may tend more to behave according to their identity salience.

#### *Identity Salience and Collaborative Learning*

While studies proved collaborative learning's positive effects on students' learning (Dillenbourg et al., 1996; Johnson et al., 1978; Johnson & Johnson, 1983), collaborative learning was criticized for its transient quality (Thomson, 2006) and problems such as communication issues, perceived group statuses (Barron, 2003; Nuthall, 1999), effort-avoidance (Salomon & Globerson, 1989), and group tensions (Smith, 2005). Some researchers suggested that students

should be trained for collaborative activities (Johnson & Johnson, 1996), while others suggested conditions for effective collaborative learning activities. The three most recommended essential conditions for effective collaborative learning activities are mutuality, positive interdependence, and equality among group members (Damon & Phelps, 1989; Dillenbourg et al., 1996; Granott, 1993; Hardy et al., 2005; Ozmantar, 2005; Slavin, 1996; Suzuki & Kato, 1997). However, meeting these conditions or premises itself leads to more questions than providing answers or practical strategies that can be used to solve problems of collaborative learning. In addition, the condition setting approach is only a remedy approach. It puts problems of collaborative learning in a “black box”, and attempts to solve them by setting certain conditions without understanding the causes. It is like satisfied with only knowing drinking a lot of fruit juice may reduce the symptom of the fever instead of trying to understand what may cause the fever to avoid it in the future. In other words, the critical questions that related to fundamental causes of collaboration problems and motivational factors that contribute to effective collaborative learning have been left mostly untouched by researchers.

Individual's identities, in general, have potential impacts on motivation, judgment, self-esteem, and behaviors (Breckler & Greenwald, 1986; Brewer & Gardner, 1996; Kashima & Hardie, 2000; Triandis, 1989). Furthermore, as Benson and Mekolichick (2007) stated, an individual's identity salience would influence his behavior. The higher an identity in the salience hierarchy, the higher the probability that a person would perform according to that identity in a situation, as well as seek opportunities to perform in terms of that identity (Stryker, 1968). Therefore, the identity salience is important in the prediction of behavior to the degree that an

individual's relationships to specific others depend on his commitment to a particular kind of identity (Stryker, 1968). For that reason, using identity salience as a prism to analyze the nature of collaborative learning may possibly help researchers and practitioners to diagnose the failure of collaborative learning and improve collective learning activities.

The individual identity salience orients towards one's own interests and profit (Brewer & Gardner, 1996; Kashima & Hardie, 2000; Lord et al., 1999). It does not resonate with the collaborative learning setting that emphasizes collaborative efforts. Therefore, the mismatch may hinder an individual's tendency to perform that identity. As Stryker and Burke (2000) pointed out a mismatch or discrepancy between an individual's identity salience and the environment results in negative emotions or disfavor. According to Eagly and Chaiken (1993), an attitude is "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (p. 1). Consequently, students with individual identity salience may feel uncomfortable working in a collaborative setting, and develop a negative attitude toward collaborative learning activities. In addition, in a collaborative learning activity, participants with individual identity salience tend to focus on their own interests instead of benefits of the group. Consequently, it may cause the reluctance of resources sharing and communication. A participant with individual salience may avoid putting effort into the collaborative work and let other group members do the group work, while he/she focuses only on his own work or just relax. A participant with individual salience may also be eager to take the leader's role and ignore other group members' contributions and feelings. It may eventually cause group tension. When there are two or more participants fighting for group leadership, the group tension is predictable.

As Turner (1982) suggested, social identity processes were fundamental for understanding group behavior. The social identity, on the contrary, is closely related to the success of collaboration with its relational and group orientation. Collective identity salience places a premium on the success of the group other than his own success or benefit (Brewer & Gardner, 1996; Kashima & Hardie, 2000; Lord et al., 1999), while the relational identity salience values interdependence (Markus & Kitayama, 1991). Both of these two identity saliences are more consistent with the collaborative learning setting. As a result, students with collective or relational identity salience may feel more comfortable working in collaborative groups, and develop a more positive attitude toward collaborative learning activities than students with individual identity salience.

An essential attribute of collective identity is that individuals may subordinate their personal goals to the group goals (Triandis, Bontempo, & Villareal, 1988), which is consistent with one premise of collaboration: common operative goals and activities (Granott, 1993). Hardy and his colleagues claimed (2005) the critical importance of collective identity in achieving effective collaboration. They pointed out that collective identity enabled participants to construct themselves, the problems, and the solutions as part of a collaborative framework as well as a resource for participants in future conversations. When a participant has the collective identity salience, he may place a premium on the success of the group, rather than his own success or benefit (Brewer & Gardner, 1996; Kashima & Hardie, 2000; Lord et al., 1999) and the group welfare becomes an end in itself (Markus & Kitayama, 1991). Therefore, group members will be willing to share their ideas, knowledge, and put more effort into the group work instead of

focusing on their own interests. However, only having the sense of sharing goals or collective identity is not sufficient for high level peer collaboration. For example, in order to get the task accomplished as soon as possible, the most competent peer in a group, with strong collective identity, may finish all the group tasks alone. This may meet the group goal; however, his behavior will hinder other group members' chances of learning. In addition, letting a few members complete the group task is not the essential goal of collaborative learning. The purpose of collaborative learning is to "make each member a stronger individual in their own right (Johnson & Johnson, 1996, p. 793). As pointed out by Ozmentar (2005), group members' misconception of assumed roles, such as one group member inappropriately assuming the leader's role, may cause the collapse of peer collaboration.

The relational identity, on the other hand, is based on the awareness of interdependence among group members. Experiencing interdependence entails seeing oneself as part of an encompassing social relationship and recognizing that one's behavior is contingent on and to a large extent organized by what the actor perceives to be the thoughts, feelings, and actions of others in the relationship (Markus & Kitayama, 1991). Therefore, participants with relational identity tend to pay attention to group members' needs, listen to others' perspectives, share their knowledge and resources with group members, and avoid conflicts. Taken together, students' different identity salience may lead them to behave differently in collaborative learning activities, and that eventually contributes to the success or failure of a collaborative learning activity.

### *Research in Identity and Collaborative Learning*

Current research on identity and collaborative learning includes two major trends. One

trend focuses mainly on identity instead of collaboration. It takes collaborative learning environments as the social environment that forms students' identities. For example, Suzuki's (Suzuki & Kato, 1997) study showed that a collaborative learning activity could also be a process of on-going formation of identity through social interactions.

On the other hand, some researchers focus their studies on the possibility of analyzing collaborative activities through the prism of identity. For example, Dukerich, Golden, and Shortell's (2002) study proved the potential of using identity as a prism to explain people's behavior in collaboration. Milton and Westphal (2005) found that collaboration was influenced by the consistency between individuals' social environment and their self-identities. A study conducted by Ellemers, Kortekaas, and Ouwerkerk (1999) indicated that group favoritism was related to people's social identity, instead of their personal identity or self-esteem.

Research that investigates the relationship between identity salience and collaborative learning is scarce. A study conducted by Michinovs (2004) indicated that group processes depended strongly on the salience of the participants' social identity. The salience of social identity could enhance group identification, interaction pattern, and group performance. If the social identity was salient, individuals would feel included as a part of the group and tend to favor their group. Ozmentar (2005) also examined the relational identity in a peer learning activity. In his study, relational identity of the peers was utilized through an examination of team members' assumed roles, self-perception, and individual tendency. This study indicated the failure of the collaborative learning activity was attributed to team members' inappropriately assumed roles, self-perceptions, and individual tendencies. Although these studies touched the

research based concerning about the influence of identity salience on collaborative learning, their focuses were either too broad to take social identity as a whole, or too narrow to base on their claim on only one problem solving case. In addition, none of these studies actually identified participants' identity salience through a scientific approach. Moreover, none of these studies focused on the relationship of different identity salience and students' experience of collaborative learning.

### *Summary*

Collaborative learning, as an important learning approach, especially peer-based collaborative learning, has been advocated widely for its potential academic advantages. Although most studies have proved the positive effects of collaborative learning in both the face-to-face approach and the computer technology-mediated approach, collaborative learning also faces skepticism for its temporary quality (Thomson, 2006). Researchers have pointed out the problems that may lead to the failure of collaborative learning activities and suggested conditions for effective collaborative learning. However, studies on the fundamental causes of collaborative learning problems and motivational factors that contribute to effective collaborative learning involve a research gap that is required to be filled. The influence of identity on an individual's behavior has been discussed by some researchers (Benson & Mekolichick, 2007; Breckler & Greenwald, 1986; Brewer & Gardner, 1996; Kashima & Hardie, 2000; Stryker, 1968; Triandis, 1989). However, studies that investigate the impact of identity on collaborative learning have proved to be insufficient. In addition, the review and analysis of literature indicated that the different (negative or positive) behavioral tendencies caused by participants' identity salience

may be critical factors that contribute to the success or failure of a collaborative activity. The importance and absence of the relevant studies signify the necessity of studies that investigate the interrelationship between these two factors: collaborative learning and identity salience.

This study focuses on face-to-face, formal, peer collaborative learning. The choice of peer-based collaborative learning is grounded on two concerns. First, peer-based collaborative learning is the most general approach of collaborative learning activities in today's classroom settings. The study of peer-based collaborative learning can contribute to the broader needs than other approaches of collaborative learning, such as collaborative learning between teachers and students. In addition, in peer collaborative learning circumstances, since there is no great power difference, students tend more to behavior according to their identity salience. The choice of focusing on face-to-face collaborative learning was based on the consideration of avoid technology relevant variables, such as technology affordance, technology efficacy of students and so on. The dotted square on Figure 5 illustrates this study's research focuses, including the impact of identity salience on students' experience of face-to-face peer collaborative learning, and the impact of the compatibility of identity salience with face-to-face peer collaborative learning on students' attitude toward collaborative learning.

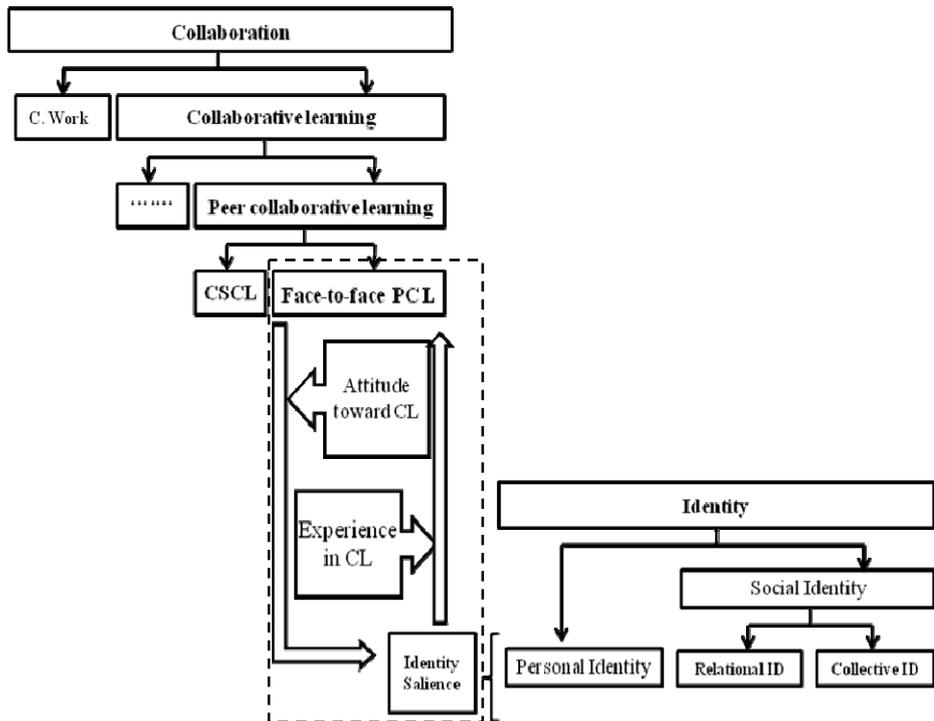


Figure 5: Diagram of the research focuses

### Chapter 3: Methodology

The purpose of this study was two-fold: to investigate whether students' identity salience is correlated with their attitudes toward the collaborative learning approach, and to explore and describe students' experience of collaborative learning activities in relation to their identity salience. The study was designed, specifically, to:

1. Determine participants' identity salience.
2. Determine whether students with social identity salience (relational and collective identity) were more positive toward the collaborative learning approach than students with individual identity salience at the graduate level.
3. Identify the impact of students' identity salience on their behaviors in collaborative learning activities.

This chapter describes the research design that was employed for the study, the instruments that were used to address the research questions, and the data collection and analysis procedures.

#### *Study Design*

This study used a two-phase, sequential, mixed methods explanatory research design with a participant selection model in which the data mixing occurred through connecting quantitative and qualitative datasets (Creswell, 2003; Creswell & Plano-Clark, 2007). The selection of this study design was based on the fact that the research questions driving this study required different data collection strategies. The sequential order of this design was driven by the fact that the purposeful selection of participants for phase II was based on the information collected and

analyzed in phase I. In addition to the sequential mixed methods design, this study also embedded a secondary triangulation design to validate the results of the quantitative hypothesis with the qualitative interview results. Figure 6 illustrates the procedure of this study design. In Figure 6, “quan” and “qual” stand for “quantitative” and “qualitative”. The notation “quan→QUAL” indicates that the methods were used in a sequence with the qualitative methods emphasized more in the study (Creswell & Plano-Clark, 2007). The two steps in the dash rectangle indicate that the quantitative and qualitative results were also used to validate each other with equal weight on both data sets for one specific research question.

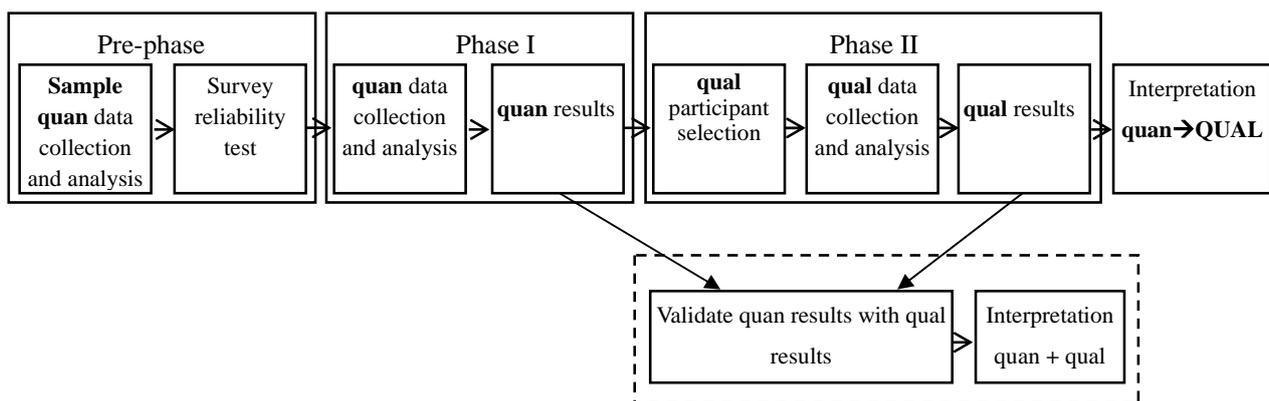


Figure 6: Procedure of this study design (adapted from: Creswell & Plano-Clark, 2007).

This study included one pre-phase and two major phases. The pre-phase was a pilot study to test the reliability of some survey questions. Survey questions that had low item correlation were deleted to make the final version of the survey highly reliable. Nunnally (1978) suggested that reliability at or above 0.70 is adequate. Garson (2008) concluded that “the widely-accepted social science cut-off is that alpha should be .70 or higher for a set of items to be considered a scale; but, some use .75 or .80 while others are as lenient as .60.” This study used the highest alpha mentioned above, 0.80, as the standard.

In phase I, the study identified participants' identity salience to build the pool of participants from which the participants of phase II (interviews) could be drawn from. In phase II, a phenomenological study of retrospective interview was conducted to explore students' collaborative learning experiences at the intra-individual level. A phenomenological study, as indicated by Rossman and Rallis (1998), investigates "the lived experience of a small number of people" in order to "understand the deep meaning of a person's experiences and how she articulate these experience" (p. 97). The participants of the follow-up, in-depth interviews consisted of students with different identity salience, students with different attitudes toward collaborative learning, and outlier cases.

In regard to the secondary triangulation design, the quantitative survey included Likert-scales to investigate participants' attitudes toward peer collaborative learning. In the qualitative interviews, the researcher also asked participants about their attitudes toward collaborative learning to validate the quantitative results.

#### *Mixed Methods Research Design*

Mixed methods research focuses on collecting, analyzing, and combining both quantitative and qualitative data in a single study or multi-phased studies (Clark, Huddleston-Casas, Churchill, Green, & Garrett, 2008; Creswell, 2003; Creswell & Plano-Clark, 2007; Tashakkori & Teddlie, 2003). Researchers have pointed out various advantages of mixed methods research design. For example, Johnson and Onwuegbuzie (2004) suggested that the "mixed methods research offers great promise for practicing researchers who would like to see methodologists describe and develop techniques that are closer to what researchers actually use

in practice” (p. 15). Because all methods have inherent biases and limitations, mixed methods design may offset or counteract these biases and limitations (Greene, Caracelli, & Graham, 1989). Mixed methods research have the possibility to bridge the schism between quantitative and qualitative research (Onwuegbuzie & Leech, 2005), offer insights that could not be gleaned from a quantitative or qualitative approach alone (Bryman, 2007), provide a better understanding of research problems (Creswell, 2005), and clarify the nature of research intentions for researchers and writers (Bryman, 2006). In other words, mixed methods research design has the possibility to reduce the weaknesses of either quantitative or a qualitative research method alone, while improving the strength of the entire study.

According to Creswell and Clark (2007), there are two types of data collection procedure: concurrent and sequential. The four mixed methods research designs suggested by Creswell and Clark were triangulation, embedded, explanatory, and exploratory design. Any of these four designs can fit into these two procedures. The exploratory and explanatory designs use sequential data collection procedure while triangulation design uses concurrent data collection procedure. The embedded design, however, can use both concurrent and sequential data collection procedures depending on each specific study.

In a triangulation design, the qualitative and quantitative methods are implemented during the same timeframe with equal weight. The data were mixed during the interpretation or analysis stages. In an embedded design, the qualitative method is a small complementary portion of the overall quantitative design or vice versa. The exploratory design is a two-phase design, in which the qualitative data are often used to develop a quantitative instrument or taxonomy. The

explanatory design is also a two-phase mixed methods design, in which the qualitative data helps explain or build upon initial quantitative results.

The explanatory design had two design models: follow-up explanation model and participant selection model. This particular study used the participant selection model in which the quantitative information was collected to identify and purposefully select participants for a follow-up, in-depth, qualitative study.

### *Survey Instrumentation*

“A survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population” (Creswell, 2003, p. 153). The major advantages of the survey instrument are inexpensive, easy to use, easy to analyze collected data, and easy to reach a large sample of a population (Russ-Eft & Preskill, 2001; Wilkinson & Birmingham, 2003).

A survey was used in this study to determine participants' identity salience and their attitudes toward collaborative learning. At the beginning of the survey, four requirements were provided to guide participants' recall of their prior collaborative learning experiences: 1) worked with classmates, 2) to accomplish class assignments or tasks, 3) that last more than one class period (from several weeks to an entire semester) , and 4) mainly through face-to-face communication.

The survey questions were divided into three sections (see Appendix C). The first section sought to measure participants' identity salience. All survey questions in this section were adapted from the Kashima and Hardie (2000) RIC-scale survey. The Kashima and Hardie

RIC-scale consists of ten items, each followed by three response items corresponding to relational, individual, and collective selves. For each question, the participants were required to choose only one of the three response items. For example, the question asked “I think it is most important in life to \_\_\_\_\_.”, the three following responses were “Have personal integrity/be true to myself” (related to individual identity aspect); “Have good personal relationships with people who are important to me” (related to relational identity aspect); “Work for causes to improve the well-being of my group” (related to indicates collective identity aspect). Participants might think more than one or all of these three responses were important or close to their thinking; the monomial choice among these three responses indicated their identity salience. This study adopted the Kashima and Hardie RIC-scale for two reasons. First, the purpose and the content of the RIC-scale instrument were completely consistent with the requirements of this study. Second, Kashima and Hardie went through eight sets of different scales that were relevant to the three self aspects to develop and test this scale. This approach ensured the validity and reliability of the instrument.

The second section of the questionnaire included five, 5-point Likert-scales ranging from “strongly agree” to “strongly disagree” to investigate participants’ attitudes toward peer collaborative learning. These questions combined questions that were developed by the researcher and questions that were adapted from Ocker and Yaverbaum’s instrument (2001): Attitude Toward Collaboration. These questions asked students to recall their prior experiences in collaborative learning activities that lasted for more than one class (from several weeks to an entire semester). Expert evaluation check, pilot study, and statistic correlation check were used to

enhance and ensure the validity and reliability of this section of the instrument.

The last section of the survey dealt with participants' demographic and other relevant information.

### *Retrospective Interviews*

In lots of research on collaborative learning, researchers have chosen the qualitative approach with a focus on participants' gestures and discourses (e.g., Ozmantar, 2005; Roschelle, 1996; Roschelle & Teasley, 1995; Waite & Davis, 2006). However, factors such as the activity design, group organization, and subject choice may all affect the validity and reliability of the study when using qualitative approach. In addition to addressing these problems, this study used retrospective interviews to collect data based on the following concerns:

1) Data accuracy and reliability: in a retrospective interview, individuals answer interview questions based on recall of past episodic experiences. It is believed that the interviewees can be more accurate and reliable than when they are forced to infer and reconstruct answers to general questions (Cote, Ericsson, & Law, 2005; Ericsson & Simon, 1993).

2) The view point of students: This study focused on students' perspective of the experience of collaborative learning; therefore, a self-reporting approach instead of third person view was more appropriate.

3) Data scale: The interview approach extended the data source to include all collaborative activities that participants had previously attended instead of only focusing on one or two activities.

4) Real world collaborative activities: The interview setting enabled the data to be drawn

from collaborative activities that reflect actual collaborative activities in today's classroom environments instead of laboratory settings.

5) Reducing possible biases and misinterpretations: The self-report approach reduced the possible biases and misinterpretations caused by the researcher.

### *Interview Protocols*

Interviews have been used by researchers to collect detailed, in-depth, and historical information through dialogical interactions between searchers and interviewees (Rossman & Rallis, 1998; Russ-Eft & Preskill, 2001; Wilkinson & Birmingham, 2003). According to Rossman and Rallis (1998) "interview takes you into participants' worlds" (p. 180).

In this study, the interviews were mainly used to explore and describe students' experiences in collaborative learning in relation to their identity salience. The interviews were also used to validate the quantitative finding on students' attitudes toward collaborative learning in relation to their identity salience. The interview protocols were formulated by the researcher under the guidance of the research questions. The interview had seven protocols. The protocol first addressed more general concerns such as students' thoughts about collaborative learning, students' experience of prior collaborative learning and so on. Protocol questions then probed more deeply by asking questions about students' priorities in collaborative learning. Because responses for questions Nos. 4 and 7 may head different directions, both questions included a follow-up, sub-questions.

In order to enhance the credibility and rigor of the qualitative data, three strategies were used: participant validation, peer debriefing, and community of practice (Rossman & Rallis,

1998). First of all, the transcriptions and the summary of the findings were sent back to the participants for them to elaborate, correct, extend, or argue about. Second, the committee chair supervised the modification of the design decisions, development of analytic categories, and explanations of the findings. Lastly, the ideas related to the interview and the interview protocol were shared and discussed with committee members and some faculties. Therefore, by triangulating the researcher's lens, participants' lens, and experts' lens (Creswell & Miller, 2000), the credibility and rigor of the qualitative phase of this study were ensured .

#### *Research Participants*

The study's population consisted of current graduate students at Virginia Tech. Ten graduate students in the School of Education attended the pilot study. A total of 143 students attended the phase I survey study (male = 41%, female = 59%). To draw a feasible but representative sample from the target population, in phase I, participants were randomly selected to include students from different age ranges and both genders. Phase II included a total of 17 participants who were selected purposefully from participants of phase I to include samples from all three types of identity salience and the outlier participants. The choice of participants also took into consideration including students with different attitudes toward collaborative learning in each identity salience group. For example, in the individual identity salience group, students' attitude scores were first categorized as high, medium, and low. The researcher, then, chose students in each category to attend the interview session.

#### *Data Collection Procedure*

The questionnaire was distributed in two ways: via school email listservs and in classes.

The participant recruitment letters were sent out through two of the School of Education email listservs to include students enrolled on the main campus and students enrolled at the off-campus locations. The recruitment letter provided preliminary information about the study and included the URL to the electronic questionnaire. In addition to sending out recruitment letter through mail lists, the researcher also contacted five graduate instructors to get their consent to recruit participants in their classes. Four instructors chose to send out the recruitment letter to their students after classes through email listservs. One instructor preferred to use hardcopies at the end of her class. After the researcher introduced the study in the class, both the instructor and the researcher exited the classroom and left the survey. The researcher collected the survey after all students left the classroom. In the pilot study, the researcher delivered the questionnaires to the participants directly to ensure a high returning rate. After the quantitative data was collected, processed, and analyzed, the researcher selected and interviewed 17 participants in a secure setting on campus. Each participant was interviewed by following the interview protocol. Each interview lasted approximately 30 minutes. A digital audio-recording device recorded participants' responses.

#### *Data Analysis Techniques*

The participants' responses to the survey corresponded to different identity aspects on the RIC-scale survey. In the Phase I survey, the researcher used the participants' response tendency to identify each participant's identity salience. A one-way ANOVA was used to test the relationship between participants' identity salience and their attitudes toward peer collaborative learning. A post hoc test was used to test the power of the study and the minimal sample size.

In the phase II interview, transcriptions and field notes were created as soon as possible after the interviews to ensure the accuracy of the interview data. The perceptions of each participant were recorded and the common themes were documented. The data analysis process took six rounds. In round one, each transcript was coded according to the research questions. For example, in a transcription, any sections that talked about group tension were highlighted in red while sections that talked about the free-rider effect were highlighted in green. Next, all the codes from round one were copied and pasted into a separated coding sheet and organized according to the research questions. For example, responses to group tension were put together and organized based on the identity salience groups, so were the responses to the free-rider effect. In round three, codes were compared and summarized to develop a database of common traits as standard code for each research question. In round four, all the codes from round two were coded again based on the code database developed in round two. In round five, common categories and major themes were identified based on the number of common recurrences. After themes were identified, each transcript was reviewed a final time for the findings. Some data were quantified for the finding in this round too.

### *Summary*

The primary purpose of this study was to find out how students' identity salience was related to their attitudes toward collaborative learning and their behaviors in collaborative learning activities. This study used mixed methods research design in which qualitative and quantitative methodologies were employed sequentially in data collection. A survey was used to identify participants' identity salience and their attitudes toward collaborative learning. After that,

some survey participants were selected to participate in the follow-up interviews. During the interview, participants were purposefully selected to include students with different identity salience, positive attitudes, and negative attitudes toward collaborative learning. Before the survey was distributed, a pilot study was employed to test the survey's validity and reliability. The survey data was collected and analyzed before the interviews. In other words, pilot study, survey data collection, survey data analysis, interview data collection, and interview data analysis were organized sequentially in this study.

## Chapter 4: Analysis of Survey and Interview Data

This chapter analyzes the research findings. The organization of the chapter follows the design model of this study. It starts from the pilot study to the quantitative component and ends with the qualitative component. In order to respond to the research questions, the discussion of the findings is arranged according the seven research questions.

### *Pilot Study*

#### *Pilot Study Participants*

The purpose of the pilot study was to test the reliability and validity of the survey questions that were developed by the researcher. These survey questions were developed to investigate students' attitudes toward peer collaborative learning. Ten graduate students at Virginia Tech participated in the pilot study. In order to save the participant pool for the real study, participants of the pilot study were recruited through the researcher's personal social network. The pilot study participants included both male and female graduate students from different programs at Virginia Tech.

#### *Pilot Study Procedure*

The survey was distributed to the participants directly or via Windows Live Messenger. Other than completing the survey, the participants also provided their suggestions and concerns about some survey questions. SPSS was used to test the reliability of these survey questions. After the reliability test, an expert check was conducted by one of the committee members. During the expert check, both the statistical findings and the participants' suggestions were also discussed by the researcher and the committee member. The survey was finalized based on the

statistical findings, suggestions from the participants, and suggestions from the committee member.

### *Reliability Test of the Survey Questions*

The first version of the survey included six questions asking about students' attitudes toward peer collaborative learning. The Cronbach's Alpha of the reliability test was 0.939 (see Table 1). This was an adequate value that indicated the tested survey questions were reliable (Garson, 2008; Howell, 1987; Nunnally, 1978). However, according to the participants' feedback, question No. 6, "I prefer working on my own instead of working with other students," was confusing. In addition, as shown in Table 2, deleting this item won't affect the overall reliability of the survey questions (from 0.939 to 0.937). Therefore, this question was deleted from the final version of the survey.

Table 1

### *Outcome of the Reliability Statistics for Pilot Study*

<b>Reliability Statistics</b>	
Cronbach's Alpha	N of Items
.939	6

Table 2

### *The Item-Total Statistics for the Six Tested Survey Questions*

<b>Item-Total Statistics</b>				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted

enjoy participating	3.70	20.011	.842	.924
lq2rev	3.60	19.156	.891	.918
learn better	3.70	18.456	.933	.912
want more	4.00	17.111	.934	.914
effective way	3.60	24.044	.612	.951
lq6rev	4.40	21.378	.737	.937

### *Quantitative Component*

#### *Description of Survey Participants*

A total of 143 graduate students from the School of Education at Virginia Tech participated in phase I, the survey study. Among the 143 responses, 2 responses had incomplete answers and 15 responses could not be identified with the participants' identity salience. These 17 responses were excluded from the data analysis.

*Gender.* As shown in Table 3, a total of 126 responses were counted as usable final data. The number of female (57.9%) and male (41.3%) participants were similar with one respondent not reporting gender information.

Table 3

#### *Gender of Respondents*

		<b>gender</b>			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	52	41.3	41.6	41.6
	female	73	57.9	58.4	100.0
	Total	125	99.2	100.0	
Missing	System	1	.8		
Total		126	100.0		

*Age.* The participants' ages ranged from 20 to 60 including: 42 (33.3%) between 20 and 30, 34 (27%) between 31 and 40; 28 (22.2%) between 41 and 50; and 21 (16.7%) between 51 and 60 and one missing data (see Table 4). Among these 126 participants, 89 of them left contact information for the follow-up interview.

Table 4

*Age of Respondents*

		<b>age2</b>			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30	42	33.3	33.6	33.6
	31-40	34	27.0	27.2	60.8
	41-50	28	22.2	22.4	83.2
	51-60	21	16.7	16.8	100.0
	Total	125	99.2	100.0	
Missing	System	1	.8		
Total		126	100.0		

*Reliability Test of the Survey Questions*

The reliability statistic test was conducted again to test the reliability of the survey questions in section II. These questions were developed by the researcher to investigate participants' attitudes toward collaborative learning. The reliability statistical findings indicated that the five research questions were reliable with the Cronbach's Alpha value of 0.852 (Garson, 2008; Howell, 1987; Nunnally, 1978).

*Quantitative Research Question 1: Identity Salience and Attitudes to Collaborative Learning*

In the first SPSS test, the researchers did not find a statistically significant relationship between participants' identity salience and their attitudes towards collaborative learning for the

126 participants. This finding was not consistent with the research hypothesis.

Boxplots, as pointed out by Howell (1987), are very useful tools for examining data with respect to dispersion. Therefore, a Boxplot test was conducted to find out the dispersion of the values that represented students' attitudes in each identity salience group. Outliers present values that are far from most other values in a set of data. An outlier could represent an error in measurement, in data recording, or in data entry. It could also represent a legitimate value that just happens to be extreme (Howell, 1987). As shown in Figure 7, the Boxplot test found five outliers: data Nos.1, 50, 51, 52, and 53. Because the values of Nos. 51 and 52 were exactly the same, No. 52 did not appear as an outlier in the first Boxplot test as shown in Figure 7 (left image). After data Nos.1, 50, 51, and 53 were filtered, No. 52 showed up as an outlier on the Boxplot (see Figure 7, right image). Among the five outliers, four came from the relational identity salience group and one came from the individual identity salience group.

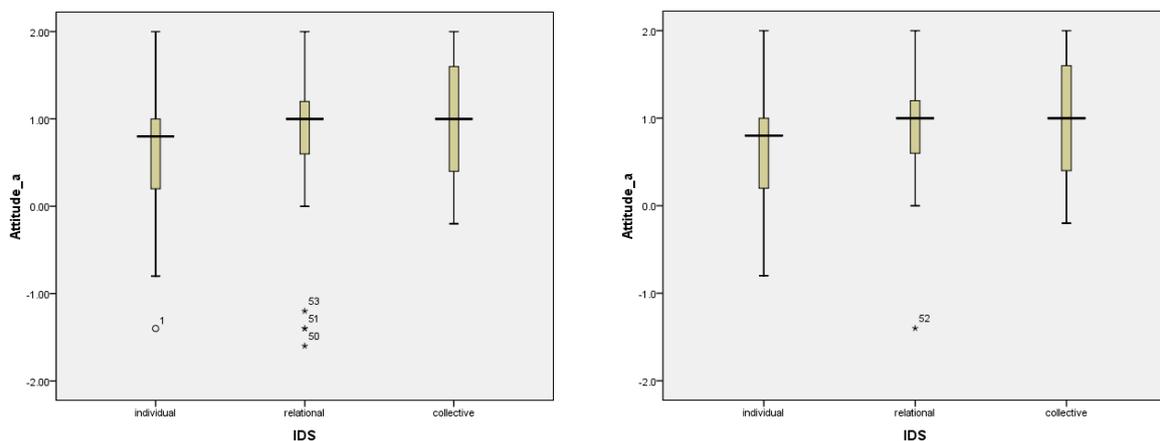


Figure 7. The Boxplots of participants' attitudes.

Howell (1987) pointed out that outliers were particularly useful for screening data to find errors and to highlight potential problems. Therefore, after locating the five outliers, the

researcher filtered these five outliers in the SPSS data set, and ran the one-way ANOVA once again based on the remaining 121 survey data.

In the survey, participants' attitudes toward collaborative learning were represented by five Likert-scales ranging from "strongly agree," "agree," "neutral," "disagree," to "strongly disagree." "Strongly agree" and "agree" stand for positive attitude toward collaborative learning, whereas "strongly disagree" and "disagree" stand for negative attitude toward collaborative learning. These literal data were conveyed to numeral data during the data analysis process as -2, 1, 0, 1, and 2. Therefore, the positive numeral values stand for positive attitudes toward collaborative learning, whereas the negative numeral values stand for negative attitudes toward collaborative learning.

The descriptive statistics of the 121 data indicated that the average attitude values of the three identity salience groups were all positive (see Table 5). That is, three identity salience groups were all positive about collaborative learning. The mean values of attitude range from 0.65 to 1.009 within the limit of -2 to 2. As shown in Figure 8, the collective identity salience group had the largest mean value, while the individual identity salience group had the smallest mean value. The relational identity salience group's mean value was similar to that of the collective identity salience group. The ANOVA outcomes (see Table 6) indicated that there was a statistically significant attitude difference between the three identity salience groups ( $F = 5.089$ ,  $p = 0.008$ ).

Table 5

*Descriptive Statistics of Participants' Attitudes toward Collaborative Learning*

### Descriptives

Attitude_a	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
individual	48	.650	.6345	.0916	.466	.834	-.8	2.0
relational	50	.972	.4314	.0610	.849	1.095	.0	2.0
collective	23	1.009	.6591	.1374	.724	1.294	-.2	2.0
Total	121	.851	.5834	.0530	.746	.956	-.8	2.0

Table 6

*The One-way ANOVA Outcomes of Participants' Attitudes Differences between Groups*

### ANOVA

Attitude_a	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.243	2	1.622	5.089	.008
Within Groups	37.599	118	.319		
Total	40.842	120			

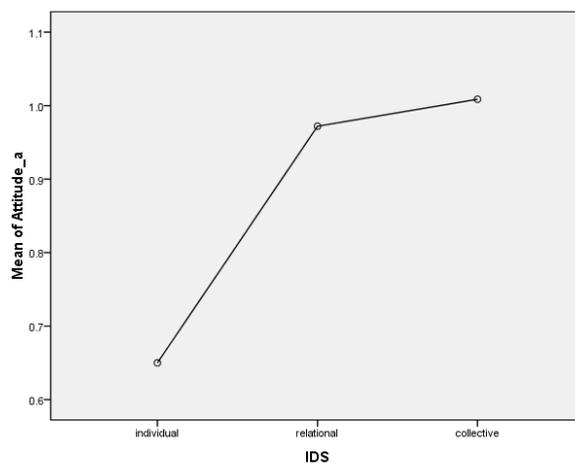


Figure 8. The mean plot of participants' attitudes.

To identify the specific location of the statistic difference among the three identity groups,

three different statistic methods, Tukey HSD, Scheffe, and LSD, were used. As shown in Table 7, these methods elicited the same results. The mean value of the individual identity salience group's attitudes toward collaborative learning was significantly lower than that of the relational identity salience and collective identity salience groups ( $p < 0.05$ ), while there was no significant difference between the relational identity salience and collective identity salience groups ( $p > 0.05$ ). This finding was consistent with the research hypothesis that students with social identity salience (relational identity salience and collective identity salience) had more positive attitudes toward collaborative learning than students with individual identity salience in the School of Education at Virginia Tech.

Table 7

*The Multiple Comparisons of Attitudes between Three Identity Salience Groups*

<b>Multiple Comparisons</b>							
Dependent Variable : Attitude_a							
	(I) IDS	(J) IDS	Mean Difference			95% Confidence Interval	
			(I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Tukey HSD	individual	relational	-.3220 <sup>*</sup>	.1141	.015	-.593	-.051
		collective	-.3587 <sup>*</sup>	.1432	.036	-.698	-.019
	relational	individual	.3220 <sup>*</sup>	.1141	.015	.051	.593
		collective	-.0367	.1422	.964	-.374	.301
	collective	individual	.3587 <sup>*</sup>	.1432	.036	.019	.698
		relational	.0367	.1422	.964	-.301	.374
Scheffe	individual	relational	-.3220 <sup>*</sup>	.1141	.021	-.605	-.039
		collective	-.3587 <sup>*</sup>	.1432	.047	-.714	-.004
	relational	individual	.3220 <sup>*</sup>	.1141	.021	.039	.605
		collective	-.0367	.1422	.967	-.389	.316
	collective	individual	.3587 <sup>*</sup>	.1432	.047	.004	.714
		relational	.0367	.1422	.964	-.301	.374

		relational	.0367	.1422	.967	-.316	.389
LSD	individual	relational	-.3220*	.1141	.006	-.548	-.096
		collective	-.3587*	.1432	.014	-.642	-.075
	relational	individual	.3220*	.1141	.006	.096	.548
		collective	-.0367	.1422	.797	-.318	.245
	collective	individual	.3587*	.1432	.014	.075	.642
		relational	.0367	.1422	.797	-.245	.318

\*. The mean difference is significant at the 0.05 level.

### *Power and Sample size*

Power is defined as the possibility of correctly rejecting a false non-hypothesis when a particular alternative hypothesis is true (Howell, 1987). This study's non-hypothesis was that there were no differences between three identity salience groups in their attitudes toward collaborative learning. As shown in Figure 9, based on the 121 participants, this study's power value was 0.842. In other words, the researcher had about 85% or greater chance of finding a statistically significant difference when there is one. According to researchers, it is generally accepted that power should be 0.8 or greater (Howell, 1987; Welkowitz, Ewen, & Cohen, 2000; Wolske & Higgs, 2009).

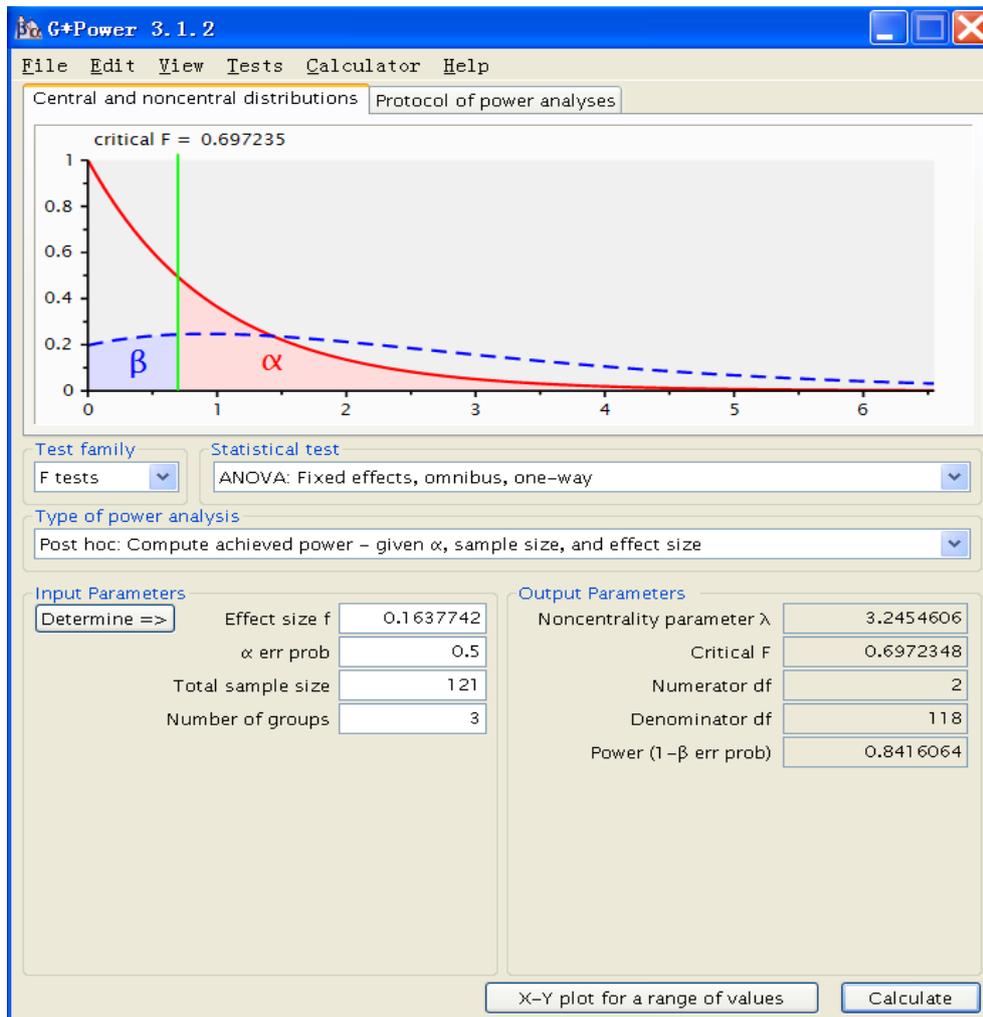


Figure 9. Power of the test.

Using 0.8 as the power, as shown in Figure 10, the G\*Power calculation indicated that the minimal sample size of the study should be 99 participants. Since this study included data from 121 participants, it proved that this study had enough participants.

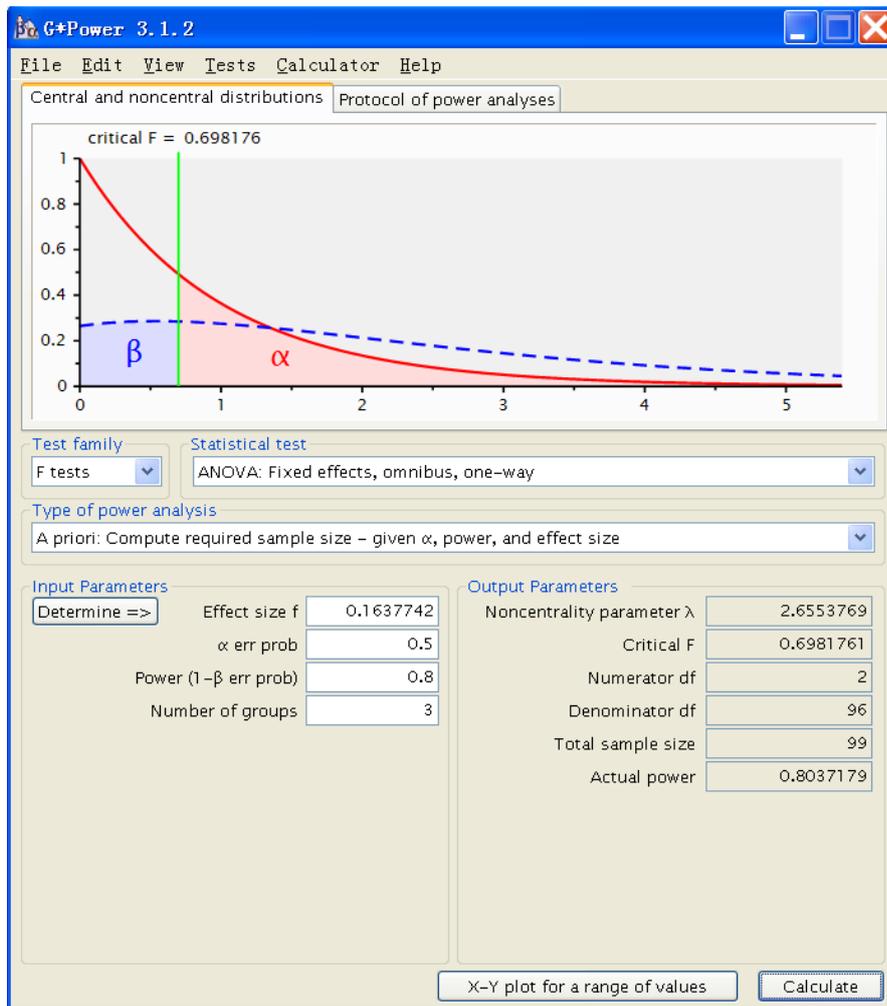


Figure 10. Minimal sample size of the test.

### *Reliability Test of the Survey (without outliers)*

After the deletion of the outliers, the researcher conducted the reliability test a third time to ensure the reliability of the quantitative data. The result was acceptable with the Cronbach's Alpha value of 0.779 (Garson, 2008; Howell, 1987; Nunnally, 1978).

### *Qualitative Component*

#### *Description of Interviewees*

Among the 126 survey participants, 89 of them left contact information indicating their

willingness to participate in the follow-up interview. Fifteen survey participants, with five from each identity salience group, were selected to participate in the follow-up interview. The participants met the following requirements. First, they confirmed their willingness to participate in the face-to-face interview through email with the researcher after the completion of the survey data analysis. Second, the participants' locations were within one-hour driving distance. Some participants indicated their willingness to participate in the follow-up interview; however, they were off-campus students who lived in places such as Northern Virginia. These locations were out of the researcher's reach for conducting face-to-face interviews considering the time and travel issues. Last, the researcher tried to cover different attitude ranges (good, medium, and bad) in each identity salience group.

The quantitative data analysis found five outliers. The numerical value of these outliers indicated these participants' extremely negative attitudes toward collaborative learning when compared with the majority in their identity salience groups. In addition, observation of the overall survey data indicated one extreme case, in which the participant answered "neutral/not sure" to all questions related to student's attitude to collaborative learning. As Creswell & Plano-Clark (2007) suggested, in a mixed methods study, when quantitative data were collected first, researchers may consider following up on the outliers or extreme cases in the second stage. In addition, the researcher also wanted to find out the reasons behind these participants' answers. Therefore, the researcher considered interviewing the participants who were responsible for the outliers and the extreme case data. Among the five outlier participants, three left contact information, and only one agreed to participate in the follow-up interview. This participant was

from the relational identity salience group, which made her the sixth interviewee of the relational identity salience group. The survey participant who provided all “neutral” answers also agreed to participate in the follow-up interview. This participant was from the individual identity salience group and that made this participant the sixth interviewee of the individual identity salience group. In sum, a total of 17 interview participants with 6 from the individual identity salience and relational identity salience groups and 5 from the collective identity salience group participated in the follow-up, in-depth interviews.

#### *The Outlier and the Extreme Case*

The survey data of the outlier indicated the participant’s extremely negative attitude toward collaborative learning. In the face-to-face interview, the reasons were asked regarding why she was so negative about collaborative learning. The participant explained that the survey responses were based on her undergraduate collaborative learning experiences. Her graduate level collaborative learning experiences were actually pleasant; she felt positive about them. This participant then answered the interview questions based on her experience of graduate level collaborative learning activities.

The extreme-case participant had both pleasant and unpleasant experiences in collaborative learning. For that reason, she felt it was hard to make clear-cut choices when answering survey questions. After completing the survey, she approached the researcher and expressed her desire to explain and expand her answers in an interview. Her interview turned out neither abnormal nor different from other interviews from the individual identity salience group. Therefore, these two participants’ interview data were included, coded, and processed in the

same way to the rest of the interview data.

*Qualitative Research Question1: Attitude toward Collaborative Learning and Identity Salience*

To validate the quantitative research findings about participants' attitudes toward collaborative learning, the researcher also asked interviewees about their attitudes toward collaborative learning in the interview section. The interviewees were asked to expand and explain some of their quantitative answers, such as "the survey data shows that you were not very optimistic about collaborative learning, can you talk about it a little bit more?" The interview findings were, somehow, consistent with the survey findings in some ways. As shown in Table 8, participants' attitudes toward collaborative learning were categorized into three themes: "like," "don't like," and "depends." "Like" and "don't like" mean that interviewees clearly stated their attitudes as either liked or didn't like collaborative learning. "Depends" means interviewees either expressed that they were neutral about collaborative learning or they provided situations in which they liked or didn't like collaborative learning. The majority of the individual identity salience participants (83.3%) reported either did not like collaborative learning or liked collaborative learning with preconditions. In contrast, most of the relational identity salience participants (83.3%) and the collective identity salience participants (60%) reported that they liked collaborative learning. None of the relational identity salience participants reported dislike of collaborative learning. In other words, the qualitative findings were also consistent with the study hypothesis that the relational identity salience and the collective identity salience students had more positive attitudes toward collaborative learning than the individual identity salience students. The only difference between the quantitative and

qualitative findings was that most survey participants expressed positive attitudes toward collaborative learning, while the interview participants clearly stated their dislike of collaborative learning directly. It may be because the use of used 5-point, Likert-scales in the survey.

Participants tended not to choose the number that represents the extremely negative attitude towards collaborative learning, since they rationally knew the benefits of collaborative learning.

Table 8

*Interviewees' Reported Attitudes toward Collaborative Learning*

Attitude to CL	Individual IS (n=6)	Relational IS (n=6)	Collective IS (n=5)
Like	1	5 (83.3%)	3 (60%)
Don't Like	2 (23.3%)	0	1
Depends	3 (60%)	1	1

The “depending” situation happened most often in the individual identity salience group, in which participants’ attitudes toward collaborative learning depended on all kinds of preconditions, such as group size limits, group dynamic requirements, or expectation of certain working styles of their peers. One individual identity salience participant talked about his preference of limited group size as the following:

I don't like working in larger groups, because it is too hard to get everybody together. Typically, on my own experience, once it gets about three people, there is usually that one person that sorts of on the side, on the preferring, and never gets... you know they sort drag their feet. They never come to meetings. They don't turn in what you hope them to turn in. So it is you, always, scramble in the last minute trying to make up for the work for that one person (Participant 8).

Another individual identity salience participant simply used “happy” and “unhappy” working with group mate as the decisive factor for her attitude toward collaborative learning:

I think it is, put in a simple way, if I feel happy working with the group mate, I like collaborative work because, it save my time, and then work with group mate I can get benefit from my peer, and I am learning from peer... So if my group mate does not do anything, then I feel unhappy (Participant 5).

Some individual identity salience participants had specific expectations of peers’ working styles. The following is one example of their opinions:

I think you really need to know who you are working with; and know how you are gonna to get along, and their work habits, because if they don’t gear with you, it makes unpleasant experience from my point of view (Participant 1).

Although these expressions were slightly different, to some extent they all indicated the individual identity salience participants’ low tolerance to students who reduced their efforts in collaborative learning activities, or in other words, the free riders. In contrast, participants from the collective identity salience group stated a different “depending” condition. For example, one participant stated: “If it is a writing project, I don’t like it. If it is other thing, as long as it does not require a lot of time outside the class to invade your personal life, then I like it” (Participant 11). In general, the individual identity salience participants had comparatively higher expectations of their peers’ performance in collaborative learning than the relational identity salience and collective identity salience participants.

There were six reasons mentioned by participants to explain why they didn’t like

collaborative learning: working more (because of free riders), scheduling issues, relying on others for the final grade, different working styles, different motivation levels, and different interests among peers (see Table 9). The individual identity salience participants' reasons centered mostly at the possibilities of working more because of the existence of free riders (n=3). The collective identity salience participants attributed their views mostly to different working styles among peers (n=2).

Table 9

*Interviewees' Reported Reasons for Their Dislike of Collaborative Learning*

Reasons for Dislike CL	Individual IS (n=5)	Relational IS (n=1)	Collective IS (n=2)	Sum
Work more (free rider)	3	1	0	4
Different working styles	1	0	2	3
Scheduling	1	1	1	3
Rely on others for the final grade	1	0	1	2
Different motivation level	0	1	1	2
Different interests	0	0	1	1

In regard to the reasons why students liked collaborative learning, one individual identity salience participants stated that "I am a leader, I like people help me and making things in group. I like it sometime" (Participant 15). Participants from relational identity salience and collective identity salience groups mentioned reasons such as easier for completing big projects, saving time, sharing different perspectives, learning from peers, making up for individual weaknesses, and accomplishing better final projects.

*Experience of collaborative learning.* Most participants reported pleasant or mostly pleasant prior collaborative learning experiences. As shown in Table 10, 83.3% of the individual identity salience and relational identity salience participants and 100% of the collective identity

salience participants reported pleasant and mostly pleasant experience of prior collaborative learning. None of the participants indicated purely unpleasant collaborative learning experience.

Table 10

*Interviewees' Reported Experience of Collaborative Learning*

Experience of CL	Individual IS (n=6)	Relational IS (n=6)	Collective IS (n=5)
Pleasant	4 (66.7%)	3 (50%)	5 (100%)
Mostly Pleasant	1 (16.7%)	2 (33.3%)	0
Mixture of pleasant and unpleasant	1	1	0

Although most participants indicated that they had pleasant collaborative learning experiences, it did not necessarily mean that all of them liked collaborative learning. The comparison between Table 6 and Table 8 indicated the chances that the individual identity salience participants didn't like collaborative learning, even though they had mostly pleasant collaborative learning experience. This finding indicated the possibility that students' attitudes toward collaborative learning might not merely depend on their prior collaborative learning experiences.

*Qualitative Research Question 2: Working Preferences and Identity Salience*

Although students' attitudes toward collaborative learning were not necessarily related to their prior collaborative learning experiences, interview data indicated that there might be a correlation between students' attitudes and their working preferences. However, without a further quantitative study, the statistic correlation between these two variables cannot be clearly identified. As shown in Table 11, none of the individual identity salience participants preferred group work. Most of them (66.7%) preferred individual work. On the contrary, most of the

relational identity salience participants (66.7%) and collective identity salience participants (60%) preferred group work.

Table 11

*Interviewees' Reported Working Preferences*

Learning Preference	Individual IS (n=6)	Relational IS (n=6)	Collective IS (n=5)
Group	0	4 (66.7%)	3 (60%)
Individual	4 (66.7%)	1	1
Depends	2	1	1

Students' different working preference should not be described as better or worse. Group working preferences or individual working preferences work for different students. However, from the perspective of promoting collaborative learning, students who preferred working in groups may adapt to the collaborative learning environments easier than students who preferred working individually. Participants provided various reasons to explain their personal working preferences. For example, regarding the individual working preference, the individual identity salience participants stated the following:

Individual assignment is a lot easier, because you know what you want to do, you (are) in charge of it, and you set your own timeline. And you don't have to worry about everybody else (Participant 8).

It is about my grade. It is affecting my life, my livelihood. It is survival for the...here, academic survival- single swim. That's why I don't like group work. I don't like rely on other people (Participant 14).

Regarding the preference of working in groups, the relational identity salience and

collective identity salience participants mentioned the following:

I don't like individuals (work). I think it is too much pressure just on me. And I think I have so much to learn from other people, and other people can possibly learn from me, what I can come and bring to the table. It is just more fun. It is more enriching to me (Participant 16).

We can accomplish more, we can learn from one another, and the result, the final result is better than if just one person has collaborated. For me, it's always very positive. Even when we have problems of different personalities, different levels of cooperation, it's always more pleasurable than unpleasant (Participant 2).

Most participants, who indicated their working preference as "depends", also provided pre-conditions for their preferences, such as whether it was a writing project, whether working with undergraduate kids, and so on. However, one "depends" participant from the individual identity salience group stated her reason as: "It depends on my mood too. Sometime, I don't want to" (Participant 15).

### *Qualitative Research Question 3: Priorities in Collaborative Learning and Identity Salience*

Participants' priorities in collaborative learning can be categorized into four groups: individual grade, final product, personal learning, and in-group relationship. Overall, the final product was the participants' most frequently mentioned priority in collaborative learning, and the in-group relationship was the least mentioned one. Only one participant from the collective identity salience group prioritized the in-group relationship. As shown in Table 12, most of the individual identity salience participants (50%) cared about their individual grade in collaborative

learning, most of the relational identity salience participants (66.7%) emphasized the final group product, and most of the collective identity salience students (60%) focused on personal learning.

Table 12

*Interviewees' Priorities in Collaborative Learning*

Priority in CL	Individual IS (n=6)	Relational IS (n=6)	Collective IS (n=5)	Sum
Grades	3 (50%)	1	0	4
Final Products	2	4 (66.7%)	1	7
Learning	1	1	3 (60%)	5
Relationship	0	0	1	1

The reasons for prioritizing personal grades included graduation and reflection of work. That is to say, participants thought their grades were most important in collaborative learning because they believed grades were crucial for their graduation and grades also represented their work. The reasons for prioritizing final products were more varied, such as “to impress peers”, “reflection of work”, “the purpose of collaborative learning”, and “future application”. In other words, participants who attached the most importance to the final product believed that a good final product could impress peers; a good final product was a good reflection of their hard work; a good final product was the ultimate goal of the collaborative learning approach; and a good final product could be extended to future research or applied in jobs. One relational identity salience participant stated:

I try to take the work (that) we are doing in the class to make it applicable to what it is I want to do, like my research interest. So, I am really concern about the quality of the work, because it may be something that I want to build up off later or use later. So, I think it's more of the quality of the work that I am more

concerned about (Participant 9).

The factor, “future application”, was also used by an relational identity salience participant to explain her emphasis on learning:

What I learn, I, then, take to my own students in class. And since I am going to be a math specialist, I am going to work with other teachers trying to teach them about math in better ways to become math teacher. If I don't know it, how can I coach or help someone else? I can't (Participant 7).

#### *Qualitative Research Question 4: Group Tension and Identity Salience*

Question four sought to find out how participants dealt with group tension in relation to their identity salience. This question included two kinds of situations. In the first situation, the interview participants were personally involved in group tension. In the second situation, the participants were not part of the group tension, but their group members got into conflicts. In the first situation, it was assumed that the participant had different ideas about the group project than one of the group members. The desire to lead the group to work according to different ideas caused the group tension. In this situation, most of the individual identity salience and relational identity salience participants specified their first inclination to follow most group members' joint choice, while none of the collective identity salience participants chose to go down this path. That is to say, the individual identity salience and relational identity salience participants preferred to have other group members involved in the conflicts to address the group tension. The following are some examples of what they stated:

I would like to restate my opinion. And if other group member still prefer the one

that, maybe, I am not so agree on, but there are more people agree to do something else, I will follow (Participant 3).

I will probably ask other group members and see how they feel and like what they feel more comfortable. What they feel, what they think, which one they think is better. Whatever the group says, we will do it. That's fine (Participant 9).

The majority of the group wants to go, that's the way I would go (Participant 7).

When the researcher followed up a question about the one-on-one situation, the relational identity salience and collective identity salience participants' answers showed a clear intention to give up their stance and follow the group member's idea with the condition that the other idea was acceptable. However, none of the individual identity salience participants took this as an option. That is to say, when there were no third parties involved in the decision making, the relational identity salience and collective identity salience participants had a stronger propensity to give up their stance in order to address the group tension than the individual identity salience students. As to the reasons behind this decision, some participants believed that it was not worth it to fight. For example, one participant stated:

It is not worth it, especially, just for a class grade. It is not a career maker, or anything like that, it is just a project for a class. It is not coming with something that is gonna to change the field (Participant 10).

Other than "not worth fighting", "do not like conflicts" was another frequently used reason by the relational identity salience participants.

In addition, relational and collective identity salience participants also mentioned the

reduced possible group tension when working with friends. They stated the following:

If I am in a group with people who are my friend already, then I don't want to hurt their feelings. So I am more reluctant to share criticism about ideas and what I think if a better product (Participant 4).

In our group here, the one that I work with as a fellow teacher (is) a friend also.

So the relationship is already there...I don't think anyone is going to be offended (Participant 7).

Concerning the situation in which other group members got into conflicts, most of the participants chose to intervene in the situation, especially the collective identity salience participants. All the collective identity salience participants chose to intervene in their group members' conflicts in order to keep the harmony in their groups. For those (n=3) who chose not to intervene, two students mentioned lack of confidence and one mentioned the disinclination to get in the middle of conflicts.

#### *Qualitative Research Question 5: The Free-rider Effect and Identity Salience*

The free-rider effect is a big issue in collaborative learning. During the interview, participants indicated six possible approaches that they used or would use to deal with free riders: "asking the instructor to intervene", "talking to the free rider directly", "making up the group work", "assigning specific tasks to the free rider", "marginalizing the free rider's part of work and make it unnoticeable", and "making up work with other group members". As shown in Table 13, most participants (individual identity salience = 66.7%; relational identity salience = 100%; collective identity salience = 100%) expressed their tendency to make up the group work when

facing the free-rider situation. The individual identity salience participants had a stronger propensity to ask the instructor to intervene in the situation as well as to confront the free riders directly than participants from the relational identity salience and collective identity salience group. An individual identity salience participant believed that:

The instructor probably has experienced it before. And make she knows (that), some ways, I couldn't help motivate the group members, so that is why (I go to the instructor). I always go to the instructor first (Participant1).

On the contrary, the relational identity salience participants clearly indicated their disinclination to get the instructor involved in addressing the free-rider issues. One relational identity salience participant stated:

It is difficult, as a graduate student, to want to approach the professor, because I feel like it shows a lack of skills on our part as a group. So I am always hesitant to go to talk to a professor about it (Participant 9).

Another relational identity salience participant shared the similar view about contacting the instructor for intervention, but from a slightly different angle:

I won't tell professor. It is not my job. I never wanted to hurt anyone's feelings.

One person is gonna to be only one person. That is also life too (Participant 10).

In addition to being reluctant to ask the instructor to intervene in the free-rider situation, the relational identity salience participants also expressed their hesitation to confront the free riders directly. They stated: "I think, I just won't want to damage that relationship" (Participant 9); and "I am not a confrontational person at all" (Participant 7).

Similar to the relational identity salience participants, the collective identity salience participants also chose not to confront free riders directly. However, their no-confrontation principle did not come from the standpoint of maintaining the group harmony, but depending on whether the free-rider effect would become a long term issue:

I wouldn't see it as a valuable use of my time. If I knew if someone is gonna to be seen every day for the next 20 years, something like that, then I would say "hi, we need to come with some sort of arrangement". But in the short time span, it just wouldn't be worth to me to confront the person and trying to get things done (Participant 12).

Instead of direct confrontation, participants from the relational identity salience and collective identity salience group chose to assign specific tasks to the free riders. The collective identity salience participants believed: "Usually, when you make the person responsible for one thing, they usually get much better in terms of participating" (Participant 11).

Table 13

*Interviewees' Approaches of Dealing with Free Riders*

Dealing With Free Riders	Individual IS (n=6)	Relational IS (n=6)	Collective IS (n=5)
Ask the instructor to intervene	4 (66.7%)	2	0
Talk to the free rider	4 (66.7%)	2	1
Make up the work	4 (66.7%)	6 (100%)	5 (100%)
Assign specific tasks to the free rider	0	1	2
Marginalize free riders' part of work and make it unnoticeable.	1	0	0
Make up the work with other group members	1	0	0

Table 14 shows the correlation between participants' approaches to deal with free riders



---

Ask instructors to intervene	I	I					IR		
Talk to the FR		I					IR	I	
Make up the work			R	C		C	IR	IC	RC
Assign specific tasks to FR					C		R	C	

---

Note, “FR” is an abbreviation for “free rider”

In addition to dealing with free riders, participants were also asked about their experience or possibilities of being free riders. Most students pointed out that their work ethic and personal integrity would not allow them to be a free rider or reduce their effort in group work under any kind of circumstances. For example, one participant stated:

Because my own level of integrity won’t let me do that, because that is not fair to them. So, if I committed to do something, I will do it. I won’t reduce my effort for what I did, once we agree to do it (Participant 8).

Another two students stated the same opinion in an indirect way:

I feel like I am cheating, because I didn’t earn the grade I got (Participant 7).

I think I am a member of the group; I need to do my contribution to the group; I need to put my effort to make the task completely, because the partners of the group are all equal (Participant 17).

One relational identity salience participant recalled the only time that she actually reduced her effort for a short period of time in one collaborative learning activity. This student stated:

When the dominant leader in our group appears, initially, I feel upset and step back for two weeks. This is the only experience, only time, that I sat back,

because she is too dominant. It is like whenever I bring out an idea or a suggestion, she doesn't let me finish my ideas, my explanation, and my reasons, and she didn't accept mine. So I feel upset, and I just sat back and to see how they can move, how can they get this project done (Participant 6).

Although this student considered being a free rider in this project, she started to participate in the group work again soon because she believed:

I am in this class too. I am in your group. I need to contribute to this project. I have my ideas. Let's talk (Participant 6).

On the contrary to this retrospective process, two participants from the individual identity salience group suggested four situations in which they might reduce their efforts in group work: bad group atmosphere, busy with other assignments, lack of ability, and sickness. One individual identity salience participant stated:

I am not a hard working person. Maybe I would work less hard. When the collaborative atmosphere is not so good, it will affect my work performance (Participant 3).

#### *Qualitative Research Question 6: Roles in Collaborative Learning and Identity Salience*

In order to find out how the role taking in collaborative group was related to students' identity salience, the researcher asked participants what roles they usually took in collaborative learning, and under what circumstances they took the specific roles. Among the three identity salience groups, participants from the collective identity salience group showed the strongest leadership tendency. Participants from the individual identity salience and relational identity

saliency groups didn't demonstrate apparent leadership tendency. A collective identity saliency participant stated, "I am usually the leader, or even if I am not, I come to be" (Participant 2). Another participant stated "I would say, in most situations, I tend and want to be the leader, unless there is other people step up and do it" (Participant 4).

According to the participants, three reasons contributed to their taking of the leader's role in collaborative learning settings: organizing or talkative personality, knowing more about content, and better prepared with plans. These three reasons can be also put as personality, prior knowledge, and hard working. Among these three reasons, the third reason is the most adjustable factor that is based on the students' desires and decisions. Among the three identity saliency groups, the relational identity saliency and collective identity saliency students indicated "prepared with plan" as an important reason as well as an effective strategy for becoming a group leader. They stated:

I will always bring a plan. I always have a plan. I am ok if we change it, but I always have something to go from (Participant 9).

I usually come to the group with some work to show. I do previous work, I bring content. And if nobody has brought anything, it is natural that the one has worked previously takes the lead (Participant 2).

Become the leader, you just come with the plan, generally (Participant 11).

Two participants from the individual identity saliency group indicated their desire to be group leaders in small groups (two to four group members). They wanted to become group leaders because they believed that being group leaders gave them better control of their grades.

As one participant stated, “I don’t want my grade to suffer” (Participant 14).

Another individual identity salience participant shared the similar stance in regard to being a group leader to have better control of the group:

In small groups, it is easy to get everybody together and come up with the idea and tell people what to do. In that way, you know exactly what you are doing, and you can control everything (Participant 8).

Few participants indicated their experience or desire of being a follower in the collaborative learning groups. As indicated by students, personal tendencies to “organize things” and “mediate discussions” were two positive reasons for being a coordinator. Participants also took whether being a subject matter expert or knowing most of the subject among peers as the determinants for whether taking the leader’s or follower’s role:

Because I am not the subject matter expert in the area. I cannot do the job as the leader. The leader is more powerful to guide the direction of the task. If I don’t have the power and strength, I will follow (Participant 17).

In addition to that, students who work for their Master’s were more likely to take the follower’s role when working with doctoral students:

If the project, if I am more experienced with certain background certain subject, I am a leader. In some conditions, because I am a master (student), other students are more experienced so I am a follower (Participant 6).

### *Summary*

Guided by the seven research questions, the researcher explored participants’ working

preferences, their attitudes, prior experiences, and priorities in collaborative learning, and the ways they dealt with collaborative learning problems. Among the three identity salience groups, participants from the relational identity salience and collective identity salience groups had more positive attitudes toward collaborative learning than students from the individual identity salience group. Most of the individual identity salience participants preferred individual work, while most of the relational identity salience and collective identity salience participants preferred group work. With regard to students' priorities in collaborative learning, the individual identity salience participants cared most about their individual grades; the relational identity salience participants emphasized most on the final products; and the collective identity salience participants focused most on personal learning. In response to dealing with possible conflicts with another group member, most of the individual identity salience and relational identity salience participants specified their first inclination to follow most group members' joint decision, while none of the collective identity salience participants chose to go down this path. As to the one-on-one situation, the relational identity salience and collective identity salience participants tended to avoid conflicts by giving up their stance when the group member's ideas were acceptable. On the contrary, none of the individual identity salience participant took this as an option. On the subject of dealing with free riders, the individual identity salience participants had lowest tolerance level. They had a propensity to ask the instructor to intervene in the situation or to confront the free riders directly. The relational identity salience participants, on the other hand, were reluctant to ask the instructor to intervene in the free-rider situation. In addition, participants from both the relational identity salience and collective identity salience groups

expressed their hesitation to confront the free riders directly. On the topic of role taking in collaborative learning groups, the collective identity salience participants showed the strongest leadership tendency. Participants reported three deciding factors for taking the leader's role: personality, prior knowledge, and hard working. Few participants indicated their desire of being a follower in collaborative learning groups. Participants took the follower's roles, mostly, when they know less about the subject content.

## Chapter 5: Discussion

This chapter examines the contribution of this study. Factors for consideration are provided for researchers who will recreate and implement the study. In addition, the research findings are discussed. Finally, recommendations for future research based on this study are suggested.

### *Contributions of This Study*

This study was instigated by the requirement of improving the effectiveness of peer collaborative learning (Hardy et al., 2005; Johnson & Johnson, 1996; Thomas & Perry, 1998; Thomson, 2006). The contributions of this study are three-fold: bridging the gap studies on collaborative learning, consummated the research trend in collaborative learning studies from the angle of identity salience, and contributed to the understanding of better prediction of predictions of the outcomes of collaborative learning.

First of all, albeit the advantages of effective peer collaborative learning, there are problems inherent in this instructional approach. Among the studies that investigated problems of collaborative learning, there was a research gap. On one hand, researchers have indicated that participants' communication problems, perceived group statuses (Barron, 2003; Nuthall, 1999), effort-avoidance/social loafing (Salomon & Globerson, 1989), and the consequent group tensions (Smith, 2005) would contribute to the failure of collaborative learning; however, the factors that lead to these problems were not investigated. On the other hand, researchers have claimed group members' mutuality, positive interdependence, and equality (Damon & Phelps, 1989; Dillenbourg et al., 1996; Granott, 1993; Hardy et al., 2005; Ozmantar, 2005; Slavin, 1996;

Suzuki & Kato, 1997) as conditions for effective collaborative learning; however, none of the prior studies investigated factors that would affect the development of these conditions. This study bridged this research gap by looking into students' experience, behavioral tendencies in collaborative learning from the perspective of identity salience theory (Brewer & Gardner, 1996; Kashima & Hardie, 2000; Sluss & Ashforth, 2007; Stryker & Burke, 2000; Stryker & Serpe, 1994).

Second, this study consummated the research trend that attempted to analyze collaborative activities through the prism of identity or identity salience. Focuses of the previous studies were mostly either too broad to take social identity as a whole, or too narrow to base on their claim on only one problem solving case. For example, Michinovs (2004) investigated the relationship between the salience of social identity and the group identification, interaction pattern, and group performance. Ozmentar (2005) examined only the relational identity in a peer learning activity. The study's findings were based only on two students' one collaborative problem solving activity. In addition, none of the prior studies actually identified participants' identity salience through a scientific approach. Third, none of the prior studies focused on the relationship of different identity salience and students' experience and behavioral tendency in collaborative learning activities.

Last, this study contributed to the understanding of the possible influences of identity salience on students' attitudes toward collaborative learning and their reactions to collaborative learning problems (e.g., group tension, free-rider effect, role taking). First, findings of this study can bring insights into the learner analysis for instructional designers to design better

collaborative learning activities. Second, findings of this study can also help instructors to predict their students' possible behaviors in collaborative learning activities. Eventually, instructors can facilitate collaborative learning better. At last, this study was the primary exploration on peer collaborative learning from the prism of students' identity salience. It laid the ground for future research in its kind.

### *Discussion of the Findings*

This study sought to find out the possible influence of students' identity salience on their attitudes, experiences, and behaviors in peer collaborative learning. For this purpose, this study was guided by one quantitative and six qualitative researcher questions. To observe how the data corresponded to the research questions, the data analysis section was guided by the research questions. In this section, the discussion of the results and findings will be grouped into two general parts to give prominence to the interrelationship among some findings. First, with the intention of explaining students' attitudes toward peer collaborative learning in relation to their identity salience, three additional elements were also explored: students' prior collaborative learning experiences, working preferences, and priorities in collaborative learning. Second, there were the three most frequently discussed detrimental factors of collaborative learning: group tension, the free-rider effect, and role taking.

#### *Attitude, Experiences, Working preference, and Priorities*

Individuals' identities have potential impacts on their motivation, judgment, self-esteem, and behaviors (Breckler & Greenwald, 1986; Brewer & Gardner, 1996; Kashima & Hardie, 2000; Triandis, 1989). Therefore, an individual's commitment to a particular identity, identity salience

(Stryker, 1968), may be used to predict students' behaviors in collaborative learning. The individual identity salience orients towards one's own interests and profit (Brewer & Gardner, 1996; Kashima & Hardie, 2000; Lord et al., 1999), while the collective identity salience and relational identity salience value group success and group interdependence (Brewer & Gardner, 1996; Kashima & Hardie, 2000; Lord et al., 1999; Markus & Kitayama, 1991). Collaborative learning emphasizes collaborative effort and group success. Therefore, derived from the synthesis of the understanding of collaborative learning and identity salience, the study assumed that the collective identity salience or relational identity salience students were better adapted to collaborative learning environments than the individual identity salience students. The study findings, in general, are consistent with this assumption.

First of all, most study participants reported having mostly pleasant collaborative learning experiences. In addition, both the qualitative and quantitative results were consistent with the research hypothesis in terms of students' attitudes toward collaborative learning. That is to say, with the similar prior collaborative learning experience, the relational identity salience and collective identity salience participants were more positive about collaborative learning than individual identity salience participants. The interview data indicated that the individual identity salience participants tended not to like collaborative learning or to accept collaborative learning with preconditions, such as requiring the team members to have similar working styles as them. It implies that students' attitudes toward collaborative learning might correlate to their identity salience instead of their prior collaborative learning experiences.

Second, the results also indicated that the individual identity salience participants

preferred to work individually, while relational identity salience and collective identity salience participants preferred to work in groups. This finding brought up a new question, whether students' attitudes toward collaborative learning were related to their working preferences or their identity salience. The other possibility is that students' working preference is also related to students' identity salience. There are two possible logics. On one hand, students' identity salience influences both their attitudes toward collaborative learning and their working preferences. On the other hand, students' identity salience affects their working preferences. Consequently, they liked or disliked working in collaborative learning setting based on their working preferences.

Third, under the circumstances of working collaboratively, the relational identity salience and collective identity salience participants preferred a larger group than the individual identity salience participants. The number of group members that were preferred by the relational identity salience and collective identity salience participants ranged from three to seven, while the maximum group members for the individual identity salience participants was four.

Last, in regard to students' priorities in collaborative learning most students emphasized final products. As predicted by the identity salience theory that individual identity salience orients towards mostly to one's own interests and profit (Brewer & Gardner, 1996; Kashima & Hardie, 2000; Lord et al., 1999), the individual identity salience students cared most about their individual grades in collaborative learning. The individual identity salience student prioritized their grades most because they believed that grades were crucial for their graduation. Most of the relational identity salience students emphasized final products, while the majority of the collective identity salience students attached the most importance to learning in collaborative

learning setting. They considered more about the future uses and applications of what they learned from collaborative learning than the immediate interests.

#### *Group Tension, the Free-rider Effect, and Role Taking*

The relational identity salience participants' answers to questions concerning group tension, the free-rider effect, and role taking reflected their value on group relationship and interdependence as predicted by Markus and Kitayama (1991). When getting involved in conflicts with another group member, the relational identity salience students tended to refer to the rest of the group members for the final decision; otherwise, they tended to give up their stance in order to avoid the group tension. "Do not like conflicts" or "do not want to damage relationship" was one of the clearly stated reasons for their decisions. Based on the same reason, when facing free riders in their groups, the relational identity salience students tended to make up the group work without asking for instructors' intervention or confronting the free riders directly.

The collective identity salience participants showed the strongest leadership tendency among the three identity salience groups. Some of them brought plans to group meetings as their strategies to ensure their leadership. The collective identity salience participants were, to some extent, consistent with what they were predicted that they placed a premium on the success of the group (Brewer & Gardner, 1996; Kashima & Hardie, 2000; Lord et al., 1999). For example, when getting involved in group conflicts, they might choose to give up their stance when the other student's idea was acceptable. However, they won't consider consulting with the rest of the group members for the final decision. They might use strategies or, sometimes, direct confrontations to get work done in the ways that they thought were the best. In addition, they

always chose to intervene in their group members' conflicts in order to keep the harmony in their groups. When facing the free-rider situation, they normally would not choose to confront the free riders directly, but assign them with specific tasks. If the free riders still chose to not pull their weight, the collective identity salience students would make up the group work instead of confronting them directly.

The individual identity salience participants had comparatively less confidence and strategies to deal with problems in collaborative learning. When facing free riders, the individual identity salience participants had a stronger propensity to ask for the instructor to intervene and to confront the free riders directly than the relational identity salience and collective identity salience students. Their decisions were also based on more self-interest oriented reasons than the relational identity salience and collective identity salience students. For example, when they had conflicts with the other group member, they also chose to refer to the rest of the group members for the final decision. However, when it was one-on-one situation, they tended not to give up their stance easily. Some of them might choose to go down more extreme paths such as stop working with that group member or reduce their personal effort in group work. Some of them tended to be leaders in small groups for getting better control of their grades. The individual identity salience group participants were also the only group to admit the possibilities of being free riders.

### *Recommendations*

From the discussion of the findings, it is clear that the individual identity salience, relational identity salience, and collective identity salience participants had different preferences

and behavioral tendencies while working in collaborative groups. To avoid problems that may lead to ineffectiveness or failure of collaborative learning, such as group tension and the free-rider effect, the following are some suggestions for grouping students in collaborative learning activities:

1. As shown in the data, participants had different group size preferences. In general, individual identity salience participants preferred small groups with two to three group members, while collective and relational identity salience preferred comparatively larger groups with maximum of seven group members. Therefore, it might be better to allow flexible group sizing in collaborative learning, so students can choose to work in small groups or large groups based on their preferences.
2. Participants had different working preferences. Individual identity salience participants, especially, had preconditions for them to favor working in collaborative groups such as certain working styles of peers. Therefore, the researcher recommends that the instructors allow students to choose their group members instead of doing this for them. By allowing self-grouping, students may work with those who share similar working styles to them. In addition, students can also choose to work with friends. Both relational and collective identity participants mentioned their behavioral changes when working with friends, such as being reluctant to share criticism, which to some extent, decrease the possibility of group tension.
3. Relational identity salience students have the propensity to be peace makers in collaborative groups. Therefore, it might be better to include at least one relational

identity salience student in a collaborative learning group, when it has more than two group members, to smooth the positional group tension.

4. When choosing a member to be grouped with an individual identity salience student, the individual identity salience student's competency and content knowledge should be taken into consideration.

On one hand, if the individual identity salience student is a highly competent student, he or she may tend to fight for the control of the group to ensure their grades. In order to motivate him/her, it would be better to group him/her with a relational identity salience student. Relational identity salience students have a natural tendency to avoid conflicts; therefore, when grouped with the individual identity salience student, he/she might not fight with the individual identity salience student for leadership, thus to make the group work more smoothly.

On the other hand, if the individual identity salience student is not competent in the subject matter, it might be better to group them with a collective identity salience student. First, the less competent individual identity salience students have the strongest propensity to be free riders when comparing to relational identity and collective identity salience students. Second, collective identity salience students tend to take the leader's role in collaborative learning groups. Third, when facing free riders, collective identity salience group leaders tend to assign tasks to the free riders instead of merely making up the work. Therefore, in this case, collective identity salience student will take the leader's role and assign the individual identity salience student

specific tasks to keep them working in the group. The relational identity salience tend to make up the work without confronting the free riders in order to avoid conflicts. Therefore, if the low competent individual identity salience student is grouped with a relational identity salience student, there are chances that the relational identity salience student may just make up the group work, which to some extent reinforces the free-rider effect.

5. The collective identity salience students have the strongest tendency to be group leaders and to hold to their stances among three identity salience groups. In addition, they are less likely to consult with the rest of the group members when they have conflicts. Therefore, when putting two highly competent collective identity salience students working in one collaborative learning group, it might increase the possibility of group tension. In other words, it might be better not to have two competent collective identity salience students working together.

On the other hand, when the high competent collective identity salience student is grouped with a relational identity salience student, the chance might be slim that the relational identity salience student will confront them when they have different opinions. When the high competent collective identity salience student is grouped with a high competent individual identity salience student, even when there is conflict, the individual identity salience student will ask for third party's opinion to avoid the failure of collaboration. The third party may be the instructor or the rest of group members depending on the size of the group.

These recommendations are based on logical deductions given the findings of this study. All thought there is a general behavioral tendency in each identity salience group. It does not mean that each individual student will behave exactly as predicted by the theory. Therefore, these recommendations should be tested empirically before implementing them in collaborative learning activities.

Since the study findings were based on graduate level participants in the School of Education at Virginia Tech, these recommendations should best be applied to similar programs at other universities. To use these recommendations, instructors need to conduct the following steps.

1. Conduct students' identity salience test at the beginning of a class by using the RIC-scale survey (see Part I, Appendix C).
2. Count each student's responses to the ten questions to identify the number of As, Bs, and Cs: As represent relational identity salience; Bs represent individual identity salience; and Cs represent collective identity salience.
3. The biggest number indicates the student's identity salience. For example, if the student has most As in his/her answers, then he/she has relational identity salience.

#### *Areas for Future Investigations*

This study has provided several topics for future research inquiries. First of all, from the discussion of the findings, it is clear that students' identity salience should be taken into consideration when grouping students for collaborative learning. For future instructional applications, experimental studies could be conducted to examine how students with different identity salience should be best grouped to make collaborative learning effective.

Second, some of the interview findings can be conveyed to a survey with the purpose of generalizing the interview findings to a larger group. For example, the survey could include questions about students' identity salience and their working preferences. Correlation could be used as a means to test the relationship between these two variables.

Third, several interview participants mentioned the differences between their undergraduate collaborative learning experiences and their graduate collaborative learning experiences. They disliked their undergraduate collaborative learning activities. In the future, investigation could be conducted on undergraduate collaborative learning to find out what were the factors make them different from the graduate collaborative learning.

Fourth, this study only focused on students who majored in education. Students from other majors may have less collaborative learning experiences. Therefore, their attitudes and experiences with collaborative learning could also be investigated.

Last, during the interview process, the researcher found that the part-time students had different concerns than full-time students. They cared more about scheduling because they had a full-time job to attend in addition to their academic work. In addition, chances are higher that the part-time students have family to take care of as well. Therefore, for the further research, full-time and part-time students could be differentiated when recruiting participants.

#### *Study Limitations*

In addition to the academic contributions, this study presented a number of limitations that were either inherent in the study methodologies or a result of other unanticipated issues. As a two-phase, mixed methods study, the discussion of the study's limitations starts from the

common issues of the overall design. After that, limitations are presented in relation to each specific phase.

### *Overall Design Issues*

The first limitation was embedded in the study's sequential design. Because the interview data collection could not start until the completion of the survey data analysis, there was about two and half month's time gap between these two study phases. Some participants had different collaborative learning experiences during this period of time. Consequently, their responses to the relevant survey and interview questions could be inconsistent.

It should also be noted that participants had different amount of prior collaborative learning experiences. First, some students had been exposed to a lot of collaborative learning activities, whereas others had just started experiencing it. Therefore, not all participants had experienced situations such as group tension. In addition, participants had different backgrounds in terms of their majors, native cultures, and careers. For example, some participants were full-time teachers who not only participated in collaborative learning activities as graduate students, but also implemented collaborative learning activities in their classes. Third, some participants had a lot of collaborative work experiences instead of collaborative learning experiences, which might lead them to confuse these two kinds of experiences. For these reasons, when participants were asked to answer questions based on their prior collaborative learning experiences, some might have referred to collaborative experiences other than their graduate collaborative learning experiences.

### *Phase I Survey Limitations*

*The survey design.* The survey was mainly designed and developed by the researcher. Upon the completion of data collection, a previously unseen problem of the survey was discovered: Because the study participants were constrained to graduate students, the researcher assumed that the participants would respond to the survey questions by recalling their graduate collaborative learning experiences. Due to this assumption, the researcher did not specify the academic level of the investigated collaborative learning on the survey. As a result, some participants referred to their undergraduate or even high school collaborative learning experiences when answering the survey questions.

*External validity.* External validity refers to the generalizability of findings to or across target populations, settings, and times (Howell, 1987). This study only recruited graduate students from the School of Education at Virginia Tech. Therefore, the survey findings can only be generalized to graduate students in the School of Education. Insights gained from the survey findings cannot be generalized to undergraduate students or students with different majors. In addition, because the participants were recruited through email listservs, the survey participants were composed of the main campus students, off-campus students, full-time students, and part-time students. However, the interview participants included mainly on-campus, full-time students due to the transportation issues. This incongruousness of the sampling may also reduce the external validity of the study.

*Internal validity.* Collaborative learning was a topic that a lot of graduate students were interested in. Therefore, some survey participants might have participated in other collaborative

learning studies before participating this study. The previous attended survey studies might have affected participants' responses to this survey. Second, some participants took the class about collaborative learning before or during the survey data collection. Their responses to the survey questions might be affected by what they learned in that class instead of their actual experiences.

*“Good subjects”*. The responses of survey questions depended on participants' self-reported opinions and perceptions. As a result, the survey data might be affected by the possibility of good subjects. Good subjects are the participants who attempt to act in a manner that will confirm what they perceived the researcher's hypothesis is (Howell, 1987). The good subject's responses are not accurate representations of how they actually perceived and felt. One participant told the researcher that she had conducted a study on collaborative learning before. Her communication with the researcher indicated that she assumed what the researcher was looking for and attempted to be a good subject.

#### *Phase II Interview Limitations*

The interview section has three limitations. First, the study could not guarantee the honesty of all responses. The accuracy and completion of interview information relies on the willingness of the respondents (Breakwell, Hammond, & Fife-Schaw, 1995). As Patton (2002) listed, “interview data limitations include possibly distorted responses due to personal bias, anger, anxiety, politics, and simple lack of awareness” (p. 306). In order to make the participants relax, the researcher normally initiated conversations before the actual interviews. The topics included children, makeup, research interests, or anything that the participants were interested in. During the

interview, the researcher soothed the participants when they felt unease about their answers, such as feeling “selfish” for certain answers. When this happened, the researcher confirmed that the study’s purpose was to find out what was going on in collaborative learning, and no answer would be judged. In addition, the interview locations were also open for changes based on the participants’ preferences to make them feel more comfortable. Although the researcher conducted the previous strategies to avoid distorted responses, the honesty of all responses could not be guaranteed. For example, some participants might have altered their answers when they felt their thoughts were “selfish” or “abnormal”.

Second, the participants were asked to base their answers on their personal experiences at the beginning of the interview. However, a lot of answers were still based on participants’ assumptions of what they might do due to their limited collaborative learning experiences. For example, some participants had never faced group tension.

Last, the researcher was the only data collection instrument in the interviews. The researcher also took the exclusive responsibility for data transcription, coding, and reporting. This being the case, the researcher’s personal biases might affect any phases of the data collection and data analysis. In order to avoid the possible misinterpretations caused by the researcher’s biases, the data collection followed a systematic procedure (Patton, 2002), in which, the researcher used interview protocol, recorded the interviews by a digital device, and transcribed the interviews verbatim. In reporting the data, the researcher not only used direct quotes from the interview transcriptions, but also quantified (Creswell & Plano-Clark, 2007) some data to avoid reporting

ambiguous expressions.

### *Summary*

This study has drawn from research in the fields of social psychology and instructional design to find out the possible indirect causations of the transient quality of peer collaborative learning. Students' identity salience affected their preferences and behaviors in peer collaborative learning activities, which may assist, smooth, hinder, or even cause problems in the collaboration process. The design and implementation of peer collaborative learning should take consideration of students' differences in terms of their identity salience. Different grouping formats with the consideration of students' identity salience should be tested to find out the most effective grouping of students to enhance the effectiveness of collaborative learning. Further studies will hopefully be conducted to include students with different academic levels, majors, and backgrounds.

## References

- Agrawala, M., Beers, A. C., Frohlich, B., & Hanrahan, P. (1997). *The two-user responsive workbench: Support for collaboration through individual views of a shared space*. Paper presented at the 24th annual International Conference on Computer Graphics and Interactive Techniques.
- Aiken, R. M., Bessagnet, M.-N., & Israel, J. (2005). Interaction and collaboration using an intelligent collaborative learning environment. *Education and Information Technologies, 10*(1/2), 65-80.
- Alavi, M. (1994). Computer-mediated collaborative learning: An empirical evaluation. *MIS Quarterly 18*(2), 159-174.
- Alterman, R. (2007). Representation, interaction, and intersubjectivity. *Cognitive Science, 31*(5), 815-841.
- Alterman, R., & Garland, A. (2000). Convention in joint activity. *Cognitive Science, 25*(4), 611-657.
- Anderson, T., Sanford, A., Thomson, A., & Ion, W. (2007). Computer-supported and face-to-face collaboration on design tasks. *Discourse Processes, 43*(3), 201-228.
- Banaji, M. R., & Prentice, D. A. (1994). The self in social contexts. *Annual Review of Psychology, 45*(1), 297-332.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.
- Barron, B. (2000). Achieving coordination in collaborative problem-solving groups. *The Journal of the Learning Sciences, 9*(4), 403-436.

- Barron, B. (2003). When smart groups fail. *The Journal of the Learning Sciences*, 12(3), 307-359.
- Benbunan-Fich, R., & Hiltz, S. R. (1999). Impacts of asynchronous learning networks on individual and group problem solving: A field experiment. *Group Decision and Negotiation*, 8(5), 409-426.
- Benson, D. E., & Mekolichick, J. (2007). Conceptions of self and the use of digital technologies in a learning environment. *Education*, 127(4), 498-510.
- Bettencourt, B. A. (1999). The cognitive contents of social-group identity: Values, emotions, and relationships. *European Journal of Social Psychology*, 29(1), 113-121.
- Blumer, H. (1966). Sociological implications of the thought of George Herbert Mead. *The American Journal of Sociology*, 71(5), 535-544.
- Bober, M. J., & Dennen, V. P. (2001). Intersubjectivity: Facilitating knowledge construction in online environments. *Educational Media International*, 38(4), 241-250.
- Breakwell, G. M., Hammond, S., & Fife-Schaw, C. (1995). *Research methods in psychology*. London: Sage.
- Breckler, S. J., & Greenwald, A. G. (1986). Motivational facets of the self. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (pp. 145-164). New York: Guilford Press.
- Brennan, S. E. (1990). Conversations as direct manipulation: An iconoclastic view. In B. Laurel (Ed.), *The art of human computer interface design* (pp. 393-404). Reading, MA: Addison-Wesley.

- Brewer, M. B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin*, 17(5), 475-482.
- Brewer, M. B., & Gardner, W. (1996). Who is this "we"? Levels of collective identity and self representations. *Journal of Personality and Social Psychology*, 71(1), 83-93.
- Bruffee, K. A. (1999). *Collaborative learning: Higher education, interdependence, and the authority of knowledge*. Baltimore: John Hopkins University Press.
- Bryman, A. (2006). Integrating quantitative and qualitative research: How is it done? *Qualitative Research*, 6(1), 97-113.
- Bryman, A. (2007). Barriers to integrating quantitative and qualitative research. *Journal of Mixed Methods Research*, 1(1), 8-22.
- Buckingham, D. (2008). Introducing Identity. In D. Buckingham (Ed.), *Youth, identity, and digital media* (pp. 1-24). Cambridge, MA: The MIT Press.
- Burke, P. J. (2003). Relationships among multiple identities. In P. J. Burke, T. J. Owens, R. Serpe & P. A. Thoits (Eds.), *Advances in identity theory and research* (pp. 199-214). New York: Kluwer.
- Burke, P. J., & Tully, J. C. (1977). The measurement of role identity. *Social Forces*, 55(4), 880-897.
- Chi, M. T. H., Bassok, M., Lewis, M. W., Reimann, P., & Glaser, R. (1989). Self-explanations: How students study and use examples in learning to solve problems. *Cognitive Science*, 13(2), 145-182.
- Clark, H. H. (1996). *Using Language*. New York: Cambridge University Press.

- Clark, H. H. (2005). Coordinating with each other in a material world. *Discourse Studies*, 7(4/5), 507-525.
- Clark, V. L. P., Huddleston-Casas, C. A., Churchill, S. L., Green, D. O. N., & Garrett, A. L. (2008). Mixed methods approaches in family science research. *Journal of Family Issue*, 29(11), 1543-1566.
- Cohen, E. G. (1994). Restructuring the classroom: Conditions for productive small groups. *Review of Educational Research*, 64(1), 1-35.
- Cote, J., Ericsson, K. A., & Law, M. P. (2005). Tracing the development of athletes using retrospective interview methods: A proposed interview and validation procedure for reported information. *Journal of Applied Sport Psychology*, 17(1), 1-19.
- Cote, J. E., & Levine, C. G. (2002). *Identity formation, agency, and culture: A social psychological synthesis*. Mahwah, New Jersey: Lawrence Erlbaum.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks: Sage.
- Creswell, J. W. (2005). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (Vol. Pearson Education): Upper Saddle River, NJ.
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, 39(3), 124-130.
- Creswell, J. W., & Plano-Clark, V. L. (2007). *Designing and conducting: Mixed methods research*. London: Sage.
- Cronk, G. (2005). George Herbert Mead (1863 -1931). *The internet encyclopedia of philosophy*

- Retrieved November, 19, 2008, from <http://www.iep.utm.edu/m/mead.htm>
- Damm, R. J. (2006). Education through collaboration: Learning the arts while celebrating culture. *Music Educators Journal* 93(2), 54-58.
- Damon, W. (1984). Peer education: The untapped potential. *Journal of Applied Developmental Psychology*, 5(33), 331-343.
- Damon, W., & Phelps, E. (1989). Critical distinctions among three approaches to peer education. *International Journal of Educational Research*, 13(1), 9-19.
- Davidson, P. M. (1992). The role of social interaction in cognitive development: A propaedeutic. In L. T. Winegar & J. Valsiner (Eds.), *Children's development within social context*. Hillsdale, New Jersey: Lawrence Erlbaum.
- Dennen, V. P., & Wieland, K. (2007). From interaction to intersubjectivity: Facilitating online group discourse processes. *Distance Education*, 28(3), 281-297.
- Deutsch, M. (1962). Cooperation and trust: Some theoretical notes. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (pp. 275-319). Lincoln: University of Nebraska Press.
- Dillenbourg, P. (1999). What do you mean by 'collaborative learning'? In P. Dillenbourg (Ed.), *Collaborative-learning: Cognitive and computational approaches* (pp. 1-19). Oxford: Elsevier.
- Dillenbourg, P., Baker, M., Blaye, A., & O'Malley, C. (1996). The evolution of research on collaborative learning. In E. S. P. Reiman (Ed.), *Learning in humans and machine: Towards an interdisciplinary learning science* (pp. 189-211). Oxford: Elsevier.

- Dornyei, Z. (1997). Psychological processes in cooperative language learning: Group dynamics and motivation. *The Modern Language Journal*, 81(4), 482-493.
- Driscoll, M. P. (2000). *Psychology of learning for instruction*. New York: Allyn & Bacon.
- Dukerich, J. M., Golden, B. R., & Shortell, S. M. (2002). Beauty is in the eye of the beholder: The impact of organizational identification, identity, and image on the cooperative behaviors of physicians. *Administrative Science Quarterly*, 47(3), 507-533.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich.
- Ellemers, N., Kortekaas, P., & Ouwerkerk, J. W. (1999). Self-categorisation, commitment to the group and group self-esteem as related but distinct aspects of social identity. *European Journal of Social Psychology*, 29(23), 371-389.
- Ericsson, K. A., & Simon, H. A. (1993). *Protocol analysis: Verbal reports as data*. Cambridge, MA: The MIT Press.
- Erikson, E. (1968). *Identity: Youth and crisis*. New York: Norton.
- Fawcett, L. M., & Garton, A. F. (2005). The effect of peer collaboration on children's problem-solving ability. *British Journal of Educational Psychology*, 75(2), 157-169.
- Fearson, J. D. (1999). What is identity. Unpublished Draft. Stanford University.
- Fishbaugh, M. S. E. (1997). *Models of collaboration*. Boston: Allyn And Bacon.
- Friend, M. (1990). Collaboration as a predictor for success in school reform. *Journal of Educational and Psychological Consultation*, 1(1), 69-86.
- Garson, G. D. (2008, September 9, 2009). Scales and standard measures Retrieved August 12,

- 2009, from <http://faculty.chass.ncsu.edu/garson/PA765/standard.htm>
- Gee, J. P. (2000). Identity as an analytic lens for research in education. In W. G. Secada (Ed.), *Review of Research in Education* (Vol. 25, pp. 99-125). Washington DC: American Educational Research Association.
- Gee, J. P., & Green, J. L. (1998). Discourse analysis, learning, and social practice: A methodological study. *Review of Research in Education*, 23, 119-169.
- Gergen, K. J. (1971). *The concept of self*. New York: Holt, Rinehart, and Winston.
- Gillespie, A. (2005). G. H. Mead: Theorist of the social act. *Journal for the Theory of Social Behaviour*, 35(1), 19- 39.
- Glock, H.-J. (1986). Vygotsky and mead on the self, meaning, and internalisation. *Studies in Soviet Thought*, 31(2), 131-148.
- Gokhale, A. A. (1995). Collaborative learning enhances critical thinking. *Journal of Technology Education*, 7(1), 22-30.
- Good, T. L., Mulryan, C., & McCaslin, M. Grouping for instruction in mathematics: A call for programmatic research on small-group processes. In D. Grouws (Ed.), *Handbook of research on mathematics teaching and learning* (pp. 165-196). New York: Macmillan.
- Goos, M., Galbraith, P., & Renshaw, P. (2002). Socially mediated metacognition: Creating collaborative zones of proximal development in small group problem solving. *Educational Studies in Mathematics*, 49(2), 193-223.
- Granott, N. (1993). Patterns of interaction in the co-construction of knowledge: Separate minds, joint effort, and weird creatures. In R. H. Wozniak & K. W. Fischer (Eds.), *Development*

- in context: Acting and thinking in specific environment* (pp. 183-207). Hillsdale, NJ: Lawrence Erlbaum
- Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis, 11*(3), 255-274.
- Grotevant, H. D. (1987). Toward a process model of identity formation. *Journal of Adolescent Research, 2*(3), 203-222.
- Hardy, C., Lawrence, T. B., & Grant, D. (2005). Discourse and collaboration: The role of conversations and collective identity. *Academy of Management Review, 30*(1), 58-77.
- Harskamp, E., & Ding, N. (2006). Structured collaboration versus individual learning in solving physics problems. *International Journal of Science Education, 28*(14), 1669-1688.
- Himmelman, T. (1996). On the theory and practice of transformational collaboration: Collaboration as a bridge from social service to social justice. In C. Huxham (Ed.), *Creating collaborative advantage* (pp. 19-43). Thousand Oaks, CA: Sage.
- Holland, D., Lachicotte, W. S., Skinner, D., & Cain, C. (1998). *Identity and Agency in Culture Worlds*. Cambridge, MA: Harvard University Press.
- Howell, D. C. (1987). *Statistical methods for psychology*. Boston: Duxbury.
- Ikpeze, C. (2007). Small group collaboration in peer-led electronic discourse: An analysis of group dynamics and interactions involving preservice and inservice teachers. *Journal of Technology and Teacher Education, 15*(3), 383-407.
- James, W. (1907). *Pragmatism: A new name for some old ways of thinking*. New York:

Longmans, Green & Co.

James, W. (1980). *The principle of psychology: Vol. 1.* . New York: Henry Holt and Company.

Jenkins, R. (1996). *Social identity*. London: Routledge.

John-Steiner, V., & Mahn, H. (1996). Sociocultural approaches to learning and development: A Vyotskian framework. *Educational Psychologist*, 31(3/4), 191-206.

Johnson, D. W., & Johnson, R. T. (1986). Mainstreaming and cooperative learning strategies. *Exceptional Children*, 52(6), 553-561.

Johnson, D. W., & Johnson, R. T. (1993). Cooperative learning and feedback in technology-based instruction. In J. V. Dempsey & G. C. Sales (Eds.), *Interactive instruction and feedback*. Englewood Cliffs, New Jersey: Educational Technology Publications.

Johnson, D. W., & Johnson, R. T. (1996). Cooperation and the use of technology. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 785-812). New York: Simon and Schuster.

Johnson, D. W., Johnson, R. T., & Scott, L. (1978). The effects of cooperative and individualized instruction on student attitudes and achievement. *The Journal of Social Psychology*, 104(2), 207-216.

Johnson, D. W., Johnson, R. T., & Stanne, M. (1989). Impact of goal and resource interdependence on problem-solving success. *Journal of Social Psychology*, 129(5), 621-629.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm

- whose time has come. *Educational Researcher*, 33(7), 14-26.
- Johnson, R. T., & Johnson, D. W. (1983). Effects of cooperative, competitive, and individualistic learning experiences on social development. *Exceptional Children*, 49(4), 323-329.
- Karau, S. J., & Williams, K. D. (1993). Social Loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology*, 65(4), 681-706.
- Kashima, E. S., & Hardie, E. A. (2000). The development and validation of the relational, individual, and collective self aspects (RIC) scale. *Asian Journal of Social Psychology*, 3(1), 19-48.
- Kashima, Y., Yamaguchi, S., Kim, U., Choi, S.-C., Gelfand, M. J., & Yuki, M. (1995). Culture, gender, and self: A perspective from individualism-collectivism research. *Journal of Personality and Social Psychology*, 69(5), 925-937.
- Khan, K. H., & Cangemi, J. P. (1979). Social learning theory: The role of imitation and modeling in learning socially desirable behavior. *Education*, 100(1), 41-46.
- Kirschner, P. A. (2001). Using integrated electronic environments for collaborative teaching/learning. *Research Dialogue in Learning and Instruction*, 10(2), 1-9.
- Koschmann, T. D. (1994). Toward a theory of computer support for collaborative learning. *The Journal of the Learning Sciences*, 3(3), 219-225.
- Latane, B., Williams, K., & Harkins, S. (1979). Many hands make light the work: The causes and consequences of social loafing. *Journal of Personality and Social Psychology*, 37(6), 822-832.
- Lehtinen, E., Hakkarainen, K., Lipponen, L., Rahikainen, M., & Muukkonen, H. (1999).

- Computer supported collaborative learning: A review Retrieved November 18, 2008, from <http://www.comlab.hut.fi/opetus/205/etatehtava1.pdf>
- Levin, J. D. (1992). *Theories of the self*. Washington: Hemisphere.
- Lipponen, L., Hakkarainen, K., & Paavola, S. (2004). Practices and orientations of CSCL. In J. W. Strijbos, P. A. Kirschner & R. L. Martens (Eds.), *What we know about CSCL in higher education* (pp. 31-51). Dordrecht: Kluwer.
- Lochhead, J. (1985). Teaching analytic reasoning skills through pair problem solving. In J. W. Segal, S. F. Chipman & R. Glaser (Eds.), *Thinking and learning skills. Vol. 1: Relating instruction to research* (pp. 109-131). Hillsdale, NJ: Erlbaum.
- Lord, R. G., Brown, D. J., & Freiberg, S. J. (1999). Understanding the dynamics of leadership: The role of follower self-concepts in the leader/follower relationship. *Organizational Behavior and Human Decision Processes*, 78(3), 167-203.
- Marcia, J. E. (1966). Development and validation of ego-identity status. *Journal of Personality and Social Psychology*, 3(5), 551-558.
- Marcia, J. E. (1988). *Common processes underlying ego identity, cognitive/moral development, and individuation*. New York: Springer-Verlag.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98(2), 224-253.
- Martin, J. (2007). Educating communal agents: Building on the perspectivism of G. H. Mead. *Educational Theory*, 57(4).
- McLaren, E. M., Bausch, M. E., & Ault, M. J. (2007). Collaboration strategies reported by

- teachers providing assistive technology services. *Journal of Special Education Technology*, 22(4), 16-29.
- Mead, G. H. (1934). *Mind, self & society*. Chicago, Illinois: The University of Chicago Press.
- Michinov, N., & Michinov, E. (2004). Social identity, group processes, and performance in synchronous computer-mediated communication. *Group Dynamics: Theory, Research, and Practice*, 8(1), 27-39.
- Milton, L. P., & Westphal, J. D. (2005). Identity confirmation networks and cooperation in work groups. *Academy of Management Journal*, 48(2), 191-212.
- Mitchell, J. M., Johnson, D. W., & Johnson, R. T. (2002). Are all types of cooperation equal? Impact of academic controversy versus concurrence-seeking on health education. *social Psychology of Education*, 5(4), 329-344.
- Miyake, N. (1986). Constructive interaction and the iterative process of understanding. *Cognitive Science*, 10(2), 151-177.
- Nattiv, A. (1994). Helping behaviors and math achievement gain of students using cooperative learning. *The Elementary School Journal*, 74(3), 285-297.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.
- Nuthall, G. (1999). Learning how to learn. *International Journal of Educational Research*, 31(3), 141-256.
- Ocker, R. J., & Yaverbaum, G. J. (2001). Collaborative learning environments: Exploring student attitudes and satisfaction in face-to-face and asynchronous computer conferencing settings. *Journal of Interactive Learning Research*, 12(4), 427-448.

- Onwuegbuzie, A. J., & Leech, N. L. (2005). On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies. *International Journal of Social Research Methodology*, 8(5), 375-387.
- Ormrod, J. E. (1999). *Human learning*. Upper Saddle River, NJ:: Prentice - Hall.
- Oxford, R. L. (1997). Cooperative learning, collaborative learning, and interaction: Three communicative strands in the language classroom. *The Modern Language Journal*, 81(4), 443-456.
- Ozmantar, M. F. (2005). Relational identities in peer collaboration: Self-perceptions, assumed roles and individual tendency *Eurasian Journal of Educational Research*, 20, 189-202.
- Panitz, T. (1996). A definition of collaborative vs cooperative learning Retrieved January 1st, 2009, from <http://www.friendsofchalkbytes.org/uploads/cb1398ec-0683-4f10-8909-6af19fb84986/A%20Definition%20of%20Collaborative%20vs%20Cooperative%20Learning.doc>
- Panitz, T. (1997). Collaborative versus cooperative learning: A comparison of the two concepts which will help us understand the underlying nature of interactive learning Retrieved January 1st, 2009, from [http://pirun.ku.ac.th/~btun/pdf/coop\\_collab.pdf](http://pirun.ku.ac.th/~btun/pdf/coop_collab.pdf)
- Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage.
- Pea, R. D. (1994). Seeing what we build together: Distributed multimedia learning environments for transformative communications. *Journal of the Learning Sciences*, 3(3), 285-299.
- Piaget, J. (1937). *The construction of reality in the child*. New York: Ballantine.
- Piaget, J. (1959). *The language and thought of the child*. London: Routledge & Kegan Paul.

- Pinsonneault, A., & Kraemer, K. L. (1989). The impact of technological support on groups: An assessment of the empirical research. *Decision Support Systems*, 5(2), 197-216.
- Resta, P., & Laferriere, T. (2007). Technology in support of collaborative learning. *Educational Psychology Review*, 19(1), 65-83.
- Rogow, A. M., Marcia, J. E., & slugoski, B. R. (1983). The relative importance of identity status interview components. *Journal of Youth and Adolescence*, 12(5), 387-400.
- Roschelle, J. (1992). Learning by collaborating: Convergent conceptual change. *The Journal of the Learning Sciences*, 2(3), 235-276.
- Roschelle, J. (1996). Learning by collaborating: Convergent conceptual change. In T. Koschmann (Ed.), *CSCL: Theory and practice of an emerging paradigm*. Mahwah, NJ: Lawrence Erlbaum.
- Roschelle, J., & Teasley, S. D. (1995). The construction of shared knowledge in collaborative problem solving. In C. E. O'Malley (Ed.), *Computer-supported collaborative learning* (pp. 69-197). Berlin: Springer-Verlag.
- Rossmann, G. B., & Rallis, S. F. (1998). *Learning in the field: An introduction to qualitative research* London: Sage.
- Russ-Eft, D., & Preskill, H. (2001). *Evaluation in organizations: A systematic approach to enhancing learning, performance, and change* New York: Basic Books.
- Salomon, G., & Globerson, T. (1989). When teams do not function the way they ought to. *International Journal of Educational Research* 13(1), 89-99.
- Sawyer, R. K. (2006). Analyzing collaborative discourse. In R. K. Sawyer (Ed.), *The Cambridge*

- handbook of the learning sciences*. Cambridge: Cambridge University Press.
- Schamber, J. F., & Mahoney, S. L. (2006). Assessing and improving the quality of group critical thinking exhibited in the final projects of collaborative learning groups. *The Journal of General Education*, 55(2), 103-137.
- Schwartz, S. J. (2001). The evolution of Eriksonian and Neo-Eriksonian identity theory and research: A review and integration. *Identity: An International Journal of Theory and Research*, 1(1), 7-58.
- Sedikides, C., & Brewer, M. B. (2001). Individual self, relational self, and collective self: Partners, opponents, or strangers? In C. Sedikides & M. B. Brewer (Eds.), *Individual self, relational self, collective self* (pp. 1-4). Philadelphia: Psychology Press.
- Shibley, I. A., & Zimmaro, D. M. (2002). The influence of collaborative learning on student attitudes and performance in an introductory chemistry laboratory *Chemical Education Research*, 79(6), 745-748.
- Slavin, R. E. (1990). *Cooperative learning: Theory, research, and practice*. Englewood Cliffs, NJ: Prentice-Hall.
- Slavin, R. E. (1995). *Cooperative learning: Theory, research, and practice*. Boston: Allyn & Bacon.
- Slavin, R. E. (1996). Research on cooperative learning and achievement: What we know, what we need to know. *Contemporary Educational Psychology*, 21(1), 43-69.
- Slavin, R. E. (1997). *Educational psychology: Theory into practice* (5th ed.). Needham Heights, MA: Allyn & Bacon.

- Slavin, R. E. (1999). Synthesis of research on cooperative learning. In A. C. O. L. S. Behar-Horenstein (Ed.), *Contemporary issues in curriculum* (pp. 193-203). Needham Heights, MA: Allyn and Bacon.
- Sluss, D. M., & Ashforth, B. E. (2007). Relational identity and identification: Defining ourselves through work relationships. *Academy of Management Review*, 32(1), 9-32.
- Smith, R. O. (2005). Working with difference in online collaborative groups. *Adult Education Quarterly*, 55(3), 182-199.
- Soller, A. L. (2001). Supporting social interaction in an intelligent collaborative learning system. *International Journal of Artificial Intelligence in Education*, 12(1), 40-62.
- Stahl, G., Koschmann, T., & Suthers, D. D. (2006). Computer-supported collaborative learning. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 409-425). New York: Cambridge University Press.
- Stryker, S. (1968). Identity salience and role performance: The relevance of symbolic interaction theory for family research *Journal of Marriage and the Family*, 30(4), 558-564.
- Stryker, S., & Burke, P. J. (2000). The past, present, and future of an identity theory. *Social Psychology Quarterly*, 63(4), 284-297.
- Stryker, S., & Serpe, R. T. (1994). Identity salience and psychological centrality: Equivalent, overlapping, or complementary concepts? *Social Psychology Quarterly*, 57(1), 16-35.
- Summers, J. J., Beretvas, N., & Gorin, J. S. (2005). Evaluating collaborative learning and community. *The Journal of Experimental Education*, 73(3), 165-188.
- Suzuki, H., & Kato, H. (1997). *Identity formation/transformation as the process of collaborative*

*learning through AlgoArena*. Paper presented at the CSCL '97

- Tajfel, H. (1978). Social categorization, social identity and social comparison. In H. Tajfel (Ed.), *Differentiation between social groups: Studies in the social psychology of intergroup relations* (pp. 61-76). London: Academic Press.
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations*. Monterey, CA: Brooks/Cole.
- Tashakkori, A., & Teddlie, C. (2003). Major issues and controversies in the use of mixed methods in the social and behavioral sciences. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage.
- Teasley, S. D. (1995). The role of talk in children's peer collaborations. *Developmental Psychology, 31*(2), 207-220.
- Thomas, A. M., & Perry, J. L. (1998). Can AmeriCorps build communities? *Nonprofit and Voluntary Sector Quarterly, 27*(4), 399-420.
- Thomson, A. M. (2006). Collaboration processes: Inside the Black Box. *Public Administration Review, 66*(s1), 20-32.
- Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. *Psychological Review, 96*(3), 506-520.
- Triandis, H. C., Bontempo, R., & Villareal, M. J. (1988). Individualism and collectivism: Cross-cultural perspectives on self-ingroup relationships. *Journal of Personality and*

- Social Psychology*, 54(2), 323-338.
- Tudge, J. (1992). Processes and consequences of peer collaboration: A Vygotskian Analysis. *Child Development*, 63(6), 1364-1379.
- Turner, J. C. (1982). Towards a cognitive redefinition of the social group. In H. Tajfel (Ed.), *Social identity and intergroup relations* (pp. 15-40). Cambridge, England: Cambridge University Press.
- Tutty, J. I., & Klein, J. D. (2008). Computer-mediated instruction: A comparison of online and face-to-face collaboration. *Educational Technology Research & Development*, 56(2), 101-124.
- Valsiner, J., & Veer, R. V. D. (1988). On the social nature of human cognition: An analysis of the shared intellectual roots of George Herbert Mead and Lev Vygotsky. *Journal for the Theory of Social Behaviour*, 18(1), 117-136.
- Vygotsky, L. (1976). *Mind and society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Vygotsky, L. (1978). *Mind and society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Waite, S., & Davis, B. (2006). Collaboration as a catalyst for critical thinking in undergraduate research. *Journal of Further and Higher Education*, 30(4), 405-419.
- Webb, N. M. (1984). Stability of small group interaction and achievement over time. *Journal of Educational Psychology*, 76(2), 211-224.
- Webb, N. M. (1995). Group collaboration in assessment: multiple objectives, processes, and

outcomes. *Educational Evaluation and Policy Analysis*, 17(2), 239-261.

Welkowitz, J., Ewen, R. B., & Cohen, J. (2000). *Introductory statistics for the behavioral sciences*. New York: Harcourt/Academic.

Wilkinson, D., & Birmingham, P. (2003). *Using research instruments: A guide for researchers* (1st ed.). London: Routledge Falmer.

Wolske, K., & Higgs, A. (2009). Power Analysis, Statistical Significance, & Effect Size

Retrieved February 23th, 2010, from

<http://meera.snre.umich.edu/plan-an-evaluation/plonearticlemultipage.2007-10-30.36309>

[02539/power-analysis-statistical-significance-effect-size](http://meera.snre.umich.edu/plan-an-evaluation/plonearticlemultipage.2007-10-30.36309)

Appendix

*Appendix A: IRB Approval Survey Instrument*



**Office of Research Compliance**  
 Institutional Review Board  
 2000 Kraft Drive, Suite 2000 (0497)  
 Blacksburg, Virginia 24061  
 540/231-4991 Fax 540/231-0959  
 e-mail moored@vt.edu  
 www.irb.vt.edu

FWA00000572( expires 1/20/2010)  
 IRB # is IRB00000667

DATE: June 11, 2009

MEMORANDUM

TO: John K. Burton  
 Fei Hong Wang

Approval date: 6/11/2009  
 Continuing Review Due Date: 5/27/2010  
 Expiration Date: 6/10/2010

FROM: David M. Moore 

SUBJECT: **IRB Expedited Approval:** "Effects of Students' Identity Salience on Their Attitudes Toward and Experience in Face-to-Face Peer Collaborative Learning Activities", IRB # 09-542

This memo is regarding the above-mentioned protocol. The proposed research is eligible for expedited review according to the specifications authorized by 45 CFR 46.110 and 21 CFR 56.110. As Chair of the Virginia Tech Institutional Review Board, I have granted approval to the study for a period of 12 months, effective June 11, 2009.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.
3. Report promptly to the IRB of the study's closing (i.e., data collecting and data analysis complete at Virginia Tech). If the study is to continue past the expiration date (listed above), investigators must submit a request for continuing review prior to the continuing review due date (listed above). It is the researcher's responsibility to obtain re-approval from the IRB before the study's expiration date.
4. If re-approval is not obtained (unless the study has been reported to the IRB as closed) prior to the expiration date, all activities involving human subjects and data analysis must cease immediately, except where necessary to eliminate apparent immediate hazards to the subjects.

**Important:**

If you are conducting **federally funded non-exempt research**, please send the applicable OSP/grant proposal to the IRB office, once available. OSP funds may not be released until the IRB has compared and found consistent the proposal and related IRB application.

cc: File

*Invent the Future*

VIRGINIA POLYTECHNIC INSTITUTE UNIVERSITY AND STATE UNIVERSITY

*An equal opportunity, affirmative action institution*

## *Appendix B: Recruitment Materials*

### **Recruiting Survey Participants**

- **Email**

Hi,

You are receiving this email because you are a current student or enrolled classes in the School of Education at Virginia Tech.

I am a doctoral student in the School of Education at Virginia Tech. I am collecting data for my dissertation right now. I will really appreciate if you can help me with my dissertation by completing one simple survey. It won't take you more than 5-10 minutes to finish the survey.

The objective of this study is to gather information that will help the understanding of the interrelationship between students' identity salience and their attitudes toward face-to-face collaborative learning. Collaborative learning activities are learning activities in which students work together toward shared academic goals. It is also called group work or team work. Permission to conduct this study has been granted by Virginia Tech Institutional Review Board. Your participation and responses to the questions are very important for this study. Any information you provide will be kept very confidential and only group or anonymous individual responses will be reported in the study. Thank you.

Please click the following URL to start the survey:

<https://survey.vt.edu/survey/entry.jsp?id=1243354855416>

If you have any questions, please contact me by replying this email. Thank you very much for your help.

Best Regards,

Fiona

- **In-class Recruitment**

*The instructor will introduce the study as the following:*

A doctoral student in the School of Education at Virginia Tech is collecting data for her dissertation. If you can help her by completing a survey, she will appreciate your help very much. It won't take you more than 5-10 minutes to finish the survey.

The participation of this study is voluntary. It will not contribute to your final grade for this class in any form.

The objective of this study is to gather information that will help the understanding of the interrelationship between students' identity salience and their attitudes toward face-to-face collaborative learning. Collaborative learning activities are learning activities in which students work together toward shared academic goals. It is also called group work or team work. Permission to conduct this study has been granted by Virginia Tech Institutional Review Board. Your participation and responses to the questions are very important for this study. Any information you provide will be kept very confidential and only group or anonymous individual responses will be reported in the study."

If you would like to complete the survey, please click the following URL to start the survey: <https://survey.vt.edu/survey/entry.jsp?id=1243354855416> (The instructor can post this survey URL on the course scholar or through email)

### **Recruiting Interview Participants**

The recruiting of interview participants will be posted at the end of the survey:

*"You may be contacted for a follow-up interview. Every interview participant will be rewarded with a grateful present. In addition, two participants will get an iPod Shuffle by drawing lots. If you are ok with that, please leave your contact message below. Thank you."*

Name \_\_\_\_\_

Contact Information (email or phone number)

\_\_\_\_\_

*Appendix C: Survey Instrument*

## **Student Survey about Collaborative Learning**

**If you are not at least 18 years old, please do not complete this survey. Thank you.**

### ***Introduction***

The objective of this questionnaire is to gather information that will help the understanding of the interrelationship between students' identity salience and their attitudes toward face-to-face collaborative learning at the graduate level. Collaborative learning activities are learning activities in which students work together toward shared academic goals. It is also called group work or team work. Permission to conduct this study has been granted by Virginia Tech Institutional Review Board. Your participation and responses to the questions are very important for this study. Any information you provide will be kept very confidential and only group or anonymous individual responses will be reported in the study.

### **Part I**

**Instructions:** *For questions 1-10, please **circle** only **one** option that best describes your feeling or **write** your option on the space provided.*

1. I think it is most important in life to \_\_\_\_\_
  - A. Have personal integrity/be true to myself.
  - B. Have good personal relationships with people who are important to me
  - C. Work for causes to improve the well-being of my group.
  
2. I would teach my children \_\_\_\_\_
  - A. To know themselves and develop their own potential as a unique individual
  - B. To be caring to their friends and attentive to their needs
  - C. To be loyal to the group to which they belong
  
3. I regard myself as \_\_\_\_\_

- A. Someone with his or her own will, individual
  - B. A good partner and friend
  - C. A good member of my group
4. I think honor can be attained by \_\_\_\_\_
- A. Being true to myself
  - B. Being true to people with whom I have personal relationships
  - C. Being true to my groups such as my extended family, work group, religious and social groups.
5. I would regard someone as a good employee for a company if \_\_\_\_\_
- A. He or she takes personal responsibility for the task assigned.
  - B. He or she gets on well and works cooperatively with other colleagues.
  - C. He or she works for the development of the organization or the work group
6. The most satisfying activity for me is \_\_\_\_\_
- A. Doing something for myself
  - B. Doing something for someone who is important to me
  - C. Doing something for my group (e.g., my school, church, club, neighborhood, and community)
7. When faced with an important personal decision to make \_\_\_\_\_
- A. I ask myself what I really want to do most
  - B. I talked with my partner or best friend
  - C. I talk to my family and relatives.

8. I would feel proud if \_\_\_\_\_
- A. I was praised in the news paper for what I have done.
  - B. My close friend was praised in the newspaper for what he or she has done
  - C. A group to which I belong was praised in the new paper for what they have done.
9. When I attend a musical concert \_\_\_\_\_
- A. I feel that enjoying music is a very personal experience
  - B. I feel enjoyment if my company (partner, friend, guest) also enjoy it.
  - C. I feel good to be part of the group
10. I am most concerned about \_\_\_\_\_
- A. My relationship with myself
  - B. My relationship with a specific person
  - C. My relationship with my group

## Part II

### *Perception of peer collaborative learning activities*

This part of the questionnaire asks you about your perceptions of collaborative learning based on your prior experience attending collaborative learning activities. You will be asked to indicate the level of your agreement or disagreement with a number of statements.

**Instructions:** For questions 11-22, please check the answer that best describes your perception of collaborative learning based on your experience of collaborative learning activities. Questions 11-16 and questions 17-22 are similar, but based on different scenarios. Please read the scenarios before answering the questions. *The answers indicated by letters SA, A, N, D, SD, indicate your level of agreement or disagreement with each statement.*

#### **Meaning of each letter symbol:**

**SA** = Strongly Agree; **A** = Agree; **N** = Neutral or Not Sure; **D** = Disagree; **SD** = Strongly Disagree;

*Before answering the following questions, please recall **all** the collaborative learning activities in which you:*

- 1) worked with classmates*
- 2) to accomplish class assignments or tasks*
- 3) that last **more than one class period** (from several weeks to an entire semester)*
- 4) through face- to- face communication*

---

11	I enjoy participating in collaborative learning activities.	SA	A	N	D	SD
12	I normally feel very uncomfortable working in a group or a team.	SA	A	N	D	SD
13	I can learn better in a collaborative setting.	SA	A	N	D	SD

14 I want more collaborative learning activities in other SA A N D SD  
classes or in the future.

15 I feel that group or team collaboration is an effective way SA A N D SD  
to accomplish a task

*Before answering the following questions, please recall **all** the collaborative learning activities in which you:*

- 1) worked with classmates*
- 2) to accomplish class assignments or tasks*
- 3) that last from **a few minutes to one class***
- 4) through fact- to- face communication*

16 I enjoy participating in collaborative learning activities. SA A N D SD

17 I normally feel very uncomfortable working in a group or SA A N D SD  
a team.

18 I can learn better in a collaborative setting. SA A N D SD

19 I want more collaborative learning activities in other SA A N D SD  
classes or in the future.

20 I feel that group or team collaboration is an effective way SA A N D SD  
to accomplish a task

### Part III

#### *Participant and school information*

**Instructions:** *For the following questions, please check the only box that best describes your status and write your information on the space provided.*

21. What is your gender?

Male       female

22.  Undergraduate student       Graduate student

23. What is your age in years?

Less than 20     20-25       26-30       31-35       36-40

41-45       46-50       51-55       56-60       More than 60

24. Current Program: \_\_\_\_\_

25. Current status in the program \_\_\_\_\_

26. Nationality: \_\_\_\_\_

*You may be contacted for a follow-up interview. Every interview participant will be rewarded with a **grateful present**. In addition, you may also get an **iPod Shuffle** by drawing lots. If you are ok with that, please leave your contact message below. Thank you.*

**Name** \_\_\_\_\_

**Contact Information (email or phone number)** \_\_\_\_\_

*Appendix D: Interview Questions*

Name: \_\_\_\_\_ Program: \_\_\_\_\_ Date: \_\_\_\_\_  
 Ethnicity: \_\_\_\_\_ Current status in the program \_\_\_\_\_

1. Before we start, please recall all the collaborative learning activities in which you:
  - 1) worked with classmates
  - 2) to accomplish class assignments or tasks
  - 3) that last **more than one class period** (from several weeks to an entire semester)
  - 4) through fact-to-face communication
  
2. How would you describe your collaborative learning experience, pleasant or unpleasant? Why?
  - *Pleasant:* What do you think were the key factors that contribute to your pleasant experience of collaborative learning?
  
  - *Unpleasant:* What do you think were the main reasons that caused the unpleasant experience?
  
3. What do you care about the most in a collaborative learning activity? Why?
  
4. How do you describe your status in your prior collaborative learning activities ? (a leader, follower, a coordinator?) Why?
  
5. What do you think are the reasons that you become a “leader” or a “follower”? Or under what circumstance did you become a leader or a follower?
  - *Leader:* did you happen to face the situation in which some of the group members sat back and you became the one who had to finish most of the group work? What did you do to deal with this situation? Why?
  
  - *Follower:* did you sometimes sat back and let other group members finish most of the group work? Or you paid less attention to the group work, and focused more on your other work? Why?

*Appendix E: Consent Form*

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

**Informed Consent for Participants****in Research Projects Involving Human Subjects**

Title of Project: Effects of Students' Identity Salience on Their Attitudes toward and  
Experience in Face-to-face Peer Collaborative Learning Activities

Investigator(s) Feihong Wang

**I. Purpose of this Research/Project**

The purpose of this two-phase, sequential, mixed-methods study is to understand the effects of students' identity salience on their attitudes toward and experience in face-to-face peer collaborative learning activities. The first phase is a quantitative study. This is the second phase of the study. The purpose of this phase is to explore the results from the first phase in a more depth by using qualitative interviews to probe students' experience in collaborative learning activities.

**II. Procedures**

Your role will be to share you insights, perceptions, and experiences as a student with regard to your experience in collaborative learning activities. Your function in this research process will be to allow researchers to conduct a onetime interview of approximately thirty minutes. These interviews will be conducted at a time convenient to you, the participant, between September 1, 2009 and December 9, 2009. These interviews will take place in War Memorial Hall-Virginia Tech Campus or a mutually agreeable location. In order to accurately convey the meaning of the interview, an audio recording device will be used to capture the interview.

I will use the information from this study to write a case report about you (the participant). This report will be read by you and my advisor, Dr. John Burton in order to check on the accuracy of the report. The study will not be available to any other person to be read without your written permission. You are encouraged to ask questions at any time about the nature of the study and the methods that are being used. Your suggestions and concerns are important to me. Please contact

me at any time at the phone number or email address listed below.

### **III. Risks**

There is no more than minimal risk to you, the participant.

### **IV. Benefits**

The societal benefits for conducting this research would be that information learned from this project could assist instructors and instructional designers to diagnose problems of collaborative learning, bypass its application pitfalls, and increase effective classroom integration of collaborative learning activities.

### **V. Extent of Anonymity and Confidentiality**

In order to maintain your confidentiality, pseudonyms will be used to identify you or a third party mentioned during the interview. Each participant will be labeled "Participant \_\_\_\_" according to the numerical order in which they are interviewed. Audio-recordings of interviews with responses and transcribed interviews will be stored in a file box in the home of the researcher. The researcher will transcribe the audio-recording as soon after the interview as possible. The audio files will be retained until the completion of the research, including presentation and submission of completed dissertation to the committee. The transcriptions will be kept a minimum of three years after the completion of the dissertation. Or, if the results are not published, the data will be destroyed after it is determined that no publications will result from the study.

It is possible that the Institutional Review Board (IRB) may view this study's collected data for auditing purposes. The IRB is responsible for the oversight of the protection of human subjects involved in research.

### **VI. Compensation**

You, the participant will be rewarded with a thankful gift such as a VT ball-pen or something similar at the end of the interview. You will also have a chance to win an iPod Shuffle by drawing lots (around December 9, 2009). The potential odds for winning the iPod shuffle ranges from 10% to 3% depending on the final number of interview participants. The researcher, I, will be responsible for drawing the winner. You may contact the researcher at the conclusion of this

research project (after May 1, 2010) for a summary of the research results.

### **VII. Freedom to Withdraw**

Your participation in this research project is voluntary; and you have the right to withdraw at any point of the study, for any reason, and without any prejudice, and the information collected and records and reports written will be turned over to you. You also have the right to refuse to answer any questions or respond to experimental situations that you choose without penalty.

### **VIII. Subject's Responsibilities**

I voluntarily agree to participate in this study. I have the following responsibilities:

- 1) To answer each question I choose to answer with complete honesty
- 2) To inform the researcher if I choose not to answer a particular question
- 3) To inform the researcher if I choose to withdraw from the research project
- 4) The participant agrees to allow the researchers to use a non-identifying direct quote

### **IX. Subject's Permission**

I have read the Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent:

\_\_\_\_\_ Date \_\_\_\_\_

Subject signature

Should I have any pertinent questions about this research or its conduct, and research subjects' rights, and whom

to contact in the event of a research-related injury to the subject, I may contact:

Fei Hong Wang 540-429-8221/ fwang06@vt.edu  
Investigator(s) Telephone/e-mail

John Burton 540- 231-7020 / jburton@exchange.vt.edu  
Faculty Advisor Telephone/e-mail

Dr. Penny Burge/Professor of Education      540-231-9730/ burge@vt.edu  
Departmental Reviewer/Department Head      Telephone/e-mail

---

David M. Moore      540-231- 4991/ moored@vt.edu

Chair, Virginia Tech Institutional Review  
Board for the Protection of Human Subjects  
Office of Research Compliance  
2000 Kraft Drive, Suite 2000 (0497)  
Blacksburg, VA 24060

**[NOTE: Subjects must be given a complete copy (or duplicate original) of the signed Informed Consent.]**