

Instructional Design and Technology Student and Instructor Perceptions
Regarding Collaborative Learning Groups

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ABSTRACT

Collaborative group learning is a popular method of instruction that is used in a variety of academic disciplines but little is known about how it is perceived as an instructional approach. The purpose of this study was to discover how college-level learners and instructors perceive collaborative group learning in regard to value and benefit, role of the instructor, and factors that contribute to positive and negative collaborative experiences. A non-experimental study provided information about participants in the form of descriptive data, correlational statistics, and qualitative analysis. Findings indicated that collaborative group learning was valued because it supported the achievement of learning goals, was an effective method of learning, and held professional benefit. However, value and benefit were reported to be affected by a variety of factors, such as work and reward inequities, the social context of collaboration, and the appropriateness of the activity to the learning situation and objectives. Findings related to the instructor's role showed that students acknowledged and accepted ownership of group processes; however, they also indicated that they would like the instructor to play an active role in the collaborative activity to support the learning process. This and other instructor role findings indicate the complexity of balancing instructor functions, as highlighted in results that showed some learners and instructors preferred a hands-off approach on the part of the instructor, while other learners and

instructors felt that instructor involvement was a necessity. Suggestions provided by learners and instructors regarding instructor functions that supported effective collaboration included such activities as mentoring collaborative behavior, monitoring group and individual progress, and providing clear expectations and guidance. Findings from this study may be useful for informing the design, development, and implementation of collaborative group learning activities by providing insight into the factors that contribute to effective collaborative experiences, as well as perceptual differences and similarities between the learners and instructors.

Dedication

This dissertation is dedicated to my beloved wife, Sarah. It is your support and belief in my dream that has given me the courage to accomplish this task. You are far more than a friend. You are a soul mate whom I shall evermore love and cherish. Your beauty and insight have blessed my days and I rejoice in the expectation of our eternal dance with the divine. Also, to Isabella and Tristan, my children and best friends, I thank you both for all the sacrifices you have had to make in order for me to attain my goal. Isabella, your beauty and strong mind have entranced me from the first time we met. Tristan, your quick wit and good heart have been a source of joy and strength. Both of you have helped to keep me sane when things got insane. It has been a blessing watching the two of you mature and you have my unwavering support for whatever path you follow. I love you all, forevermore.

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Chapter 1: Introduction and Need for Study

Group learning is commonly used in higher education by a variety of academic disciplines as a means to promote cognitive and socio-cognitive skills (Johnson, Johnson, & Smith, 2007). The rationale for using groups in higher education is founded on both theoretical and practical perspectives. Theoretically, group learning supports constructivist approaches to learning (Dillenbourg, Baker, Blaye, & O'Malley, 1996) including positioning the learner as active, constructive, intentional, cooperative and engaged in authentic tasks (Jonassen, Howland, Moore and Marra, 2003). Practically, group learning develops the team skills needed for the workplace (Hansen, 2006). Being able to work effectively in a group translates directly to the professional world where employers rank it among the top attributes they are looking for during interviews with college graduates (Harris Interactive as referenced in Chapman, Meuter, Toy, & Wright, 2006). Regardless of the standpoint, there is evidence pointing toward the benefits of group work as a learning environment that provides a setting for developing group work competencies.

Group learning has been the subject of much research due, in large part, to being suitable for a wide range of academic disciplines and levels of ability. In their comprehensive analysis of group learning research, Johnson and Johnson (1989) reported positive results in achievement and problem solving skills for learners working in cooperative groups, including the cognitive benefits of long term retention of learning, critical thinking, and transfer of knowledge to other situations. Further research showed a significant increase in achievement in the areas of verbal, mathematic and procedural tasks for group learning, as compared to other learning methods (Johnson et al., 2007).

In terms of the socio-cognitive benefits, psychological health and social competence are positively influenced through group learning. Slavin (1983) reported increased self-esteem and positive attitudes toward learning that stemmed from the relationship building and diversity pursuant to group learning. For example, self-esteem can improve as a member sees how they contribute to the group's success. In addition, members learn to communicate more effectively and improve other social skills that help them function independently of the group (Johnson & Johnson, 1999).

As preparation for a future career, group learning addresses the need for learners to develop interpersonal skills and better understand the complexities involved in working effectively in a group (Chapman & Auken, 2001). As a simulation of the real world, some advantages to group learning are that: (a) creativity is encouraged when group members "bounce" ideas off of each other; (b) critical reflection is necessary to assess their approach to solving a particular activity; (c) skills are learned from other group members; and (d) it is more difficult to avoid participating or "hide in the crowd" (Livingstone & Lynch, 2000). Underscoring the value of group learning, Chapman et al. (2006) declare, "The ability to work efficiently and effectively with others in a group is not merely important to a business student's success; it is mandatory" (p. 558).

Group learning in higher education is often a collaborative exercise among small groups of students working on an ill-structured problem outside of the classroom with little direct teacher supervision (Volet & Mansfield, 2006). Collaboration in group learning is desirable because it emphasizes discourse and negotiation in a loosely structured context (Crook, 1995), the consequence of which can lead to individuals actively engaged with others in the process of inquiry through which they develop a

shared understanding and work toward a common goal (Brown & Duguid, 1991). It is in these types of interactions among learners that thinking critically to negotiate understanding and solve problems can flourish, and where the real significance of collaborative learning that leads to a participatory building of knowledge can be found (Koschmann, 1996; Scardamalia & Bereiter, 1994; Wenger 1998).

Despite its widespread use and positive results, collaborative group learning does have drawbacks. Researchers have found that there are many individual, social and group process challenges facing collaborative group learning, such as learner prior experiences (Napier & Johnson, 2007), self-efficacy (Hendry, Heinrich, Lyon, Barratt, Simpson, Hyde, Gonsalkorale, Hyde, & Mgaieth, 2005), and understanding how groups function (Nevgi, Virtanen, & Niemi, 2006). Addressing the challenges faced by learners participating in a typical group project, Volet and Mansfield (2006) state that, "... even minimal levels of cooperation can present motivational and socio-emotional challenges, raising concerns about students' readiness for teamwork" (p. 342).

Group dynamic and individual attributes create many subtle nuances that must be attended to in order for the group to be effective. One such subtlety is the perception that the learner has regarding the value of group activity. The learner's perception of group learning is particularly crucial because it will have a direct influence on the learner's willingness to participate (Napier & Johnson, 2007; Woolf & Quinn, 2009). Among other factors, learner perceptions have been attributed to assumptions, the method of assessment, and the role of the instructor (Chapman & Auken, 2001; King & Behnke, 2005). Likewise, instructors have their own perspective that is driven by perceptions of value and expectations, which together with the learner perspective can confound the

issue (Phipps, Phipps, Kask, & Higgins, 2001). This has compelled researchers to call for more investigation into how learner and instructor perceptions affect group learning, and thereby better inform its implementation and facilitation (Chapman et al., 2006; Phipps et al., 2001). “If instructors can better understand the variables that influence students’ attitudes toward group work, as well as the magnitude of that influence, perhaps more positive learning environments can be created” (Chapman & Auken, 2001, p. 118).

Though collaborative learning groups are used in many academic areas of study within higher education, there are some academic disciplines where collaborative groups align more closely than others with the future professional needs of the students. In particular, IDT programs are uniquely situated to appreciate both the theoretical and practical aspects of the group learning experience (Woolf & Quinn, 2009). Yet, implementation of group learning can be tricky because of the separate perspectives of the student and instructors, as evidenced in contradictions within the literature itself regarding perceptions of group work (see Phipps et al., 2001; Tideswell, 2004). Though there has been research based on particular aspects of instructional design or technology and how it affects the learner’s perception, there is a lack of literature comparing both student and instructor perspectives either granularly or holistically. Instructional designers, therefore, should seek a thorough understanding of the factors that contribute to effective collaboration, and become cognizant of the effect that the perceptions of the constituents, student and instructor alike, have on group learning.

Statement of the problem

There is a wide range of evidence supporting the use of collaborative groups in higher education ranging from preparing learners for workplace demands to the cognitive

and socio-cognitive benefits. The development of critical thinking and interpersonal skills are examples of the outcomes of collaborative group work that are fueled by group dynamics such as diversity, roles, trust and controversy. However, the challenges derived from these same group dynamics must be overcome before the group can function effectively. In addition to group processes and social skills, there are other factors that need to be dealt with such as the learners' prior experiences and personal motivation. All of these issues have the possibility of being intensified if the context of the collaborative group work is self-directed and there is a lack of supervision and intervention. The problem facing those in higher education employing such collaborative learning groups is the effective management of group processes and the perceived responsibility for mediation and facilitation expected at the learner and instructor level. Thus, there is a need to understand from both of the constituencies' perspectives the value of group learning and the expectations of making groups successful that each assigns to the other. Particularly, as it pertains to the instructor's role and the impact it has on developing learner perceptions of collaborative group learning.

The purpose of this study is to discover how college-level learners and instructors perceive collaborative group work within a learning context, including: (a) the value that each constituency places upon collaborative group activities, (b) the factors each constituency believes contribute to successful collaboration, and (c) the expectations of accountability to successful collaboration that each constituency assigns to the other. Findings will provide insights into the practical implications for designing and facilitating collaborative learning groups by informing instructors and instructional designers of perceptual similarities and differences between students and instructors.

Organization of the Proposed Study

Chapter 1 has provided a background for this study that identifies the theoretical and practical interest in collaborative learning groups, the complexities associated with effective group work implementation and a statement of the problem. Chapter 2 offers a review of the literature related to this study. This chapter will begin by reviewing the appeal of group learning as an instructional activity in higher education. Next, the focus will turn to collaborative learning groups as an oft-implemented method of group work, reviewing its theoretical underpinnings, benefits and challenges. The review will then narrow to consider what is known about the perceptions of group learning held by learners and instructors, and how instructional design and technology is an important field that can be instrumental in developing its theory and practice. This chapter concludes with the research questions. Chapter 3 provides an explanation of the research methodology to be used in addressing the research questions. This chapter describes the research design, intended participants, and data collection and analysis strategies.

Chapter 2: Review of Literature

Introduction

The purpose of this study is to discover how college-level learners and instructors perceive collaborative group work within a learning context, including: (a) the value that each constituency places upon collaborative group activities, (b) the factors each constituency believes contribute to successful collaboration, and (c) the expectations of accountability to successful collaboration that each constituency assigns to the other. Findings will provide insights for instructors and instructional designers into the practical implications for designing and facilitating collaborative learning groups by informing them of perceptual similarities and differences between students and instructors. The review of literature related to this study included: instructional design and technology in regard to group learning environments, collaborative learning theory and practice, interdisciplinary research on group learning – particularly that regarding student and instructor perspectives. Specifically, throughout the review I sought answers to the following questions:

- Based on the literature, what is the basis for using group learning in higher education?
- What insight does the literature offer about the benefits and drawbacks associated with collaboration as a popular approach to group learning?
- What does the literature reveal about learner and instructor perspectives regarding the value of group learning, important factors for effective group learning, and the accountability each constituency assigns to the other?

- What guidance, including recommendations for research and practice, does the literature offer regarding similarities and differences between student and instructor perspectives of group learning?

The literature review in these areas found its genesis in the Fall of 2007 when I was introduced to the theoretical concepts and principles of computer supported collaborative learning. Since that time, my interest in group learning has grown to encompass the historical pretext of group dynamics, the theoretical basis of group learning, and the practical application of group learning in higher education. My primary resource for finding relevant literature was the Newman Library at Virginia Polytechnic Institute and State University that involved extensive use of the online database Education Research Complete from EBSCOhost and the Addison library catalog system. A secondary resource I used was the World Wide Web and search engines such as Yahoo and Google. In particular Google Scholar was used to track cited material and to preview possible book texts. A third resource that I used was experiential engagement with peers and faculty via courses and projects that were group learning centered. These courses not only provided opportunity to observe group activities firsthand, but allowed for purposeful discussion with others regarding group learning theories and practices. As a result of these resources this review of literature encompasses: group dynamics and processes, group learning foundations and research (primarily in the areas of cooperative and collaborative learning), as well as a wide array of discipline specific research into group learning that included education, business, science, medicine, and information systems.

The literature on group learning encompasses many academic disciplines and variations of implementation. It is necessary, therefore, to begin this literature review with an overall look at the appeal and nature of group learning in higher education, including aspects of group learning's theoretical foundations and practical demands. The review will then focus on collaborative group learning as an approach that is commonly implemented in higher education. This portion of the literature review provides an examination into the basis for collaboration and how it differs from other group learning approaches and why it is a desirable choice for group learning. In addition to the affordances of collaboration, the review will provide insight into the challenges to creating effective collaborative group learning environments.

The third section of this review examines student and instructor perspectives regarding group learning, including reported similarities and differences. The review will close with a discussion of the role the Instructional Design and Technology field plays in the research and practice of group learning environments.

Appeal and Interest of Group Learning in Higher Education

The Broad Appeal of Group Learning Across Disciplines

Groups have always been a part of the human experience. However, the study of how groups form and function is relatively new, and was not formalized until the early twentieth century by Kurt Lewin, who was instrumental in its early development and in establishing it as a credible field of research (Cartwright & Zander, 1968). Since then, there has been extensive interest in groups to the point that they are studied to some degree in a great many academic disciplines. Business, psychology, sociology, anthropology, and education are among the many academic disciplines that continue to

demonstrate an interest in group dynamics (Forsyth, 1983). Consequently, theory and research in the area of group dynamics is influenced by multiple research orientations including: (a) field theory, (b) systems theory, (c) interaction theory, (d) sociometrics, (e) psychoanalytic theory, (f) empirical-statistical models, and (g) formal models (Cartwright & Zander, 1968; Forsyth, 1983).

The study of groups, termed group dynamics, includes the study of the formation, structure, processes and management of groups and is characterized by an emphasis on empirically based research, interdependence of social phenomena, interdisciplinary relevance and practical application (Cartwright & Zander, 1968). The basic assumptions for group dynamics are that: (a) groups are pervasive, (b) groups are necessary for individual identity, (c) groups produce good and bad results, and (d) desirable outcomes can come from deliberate manipulation (Cartwright & Zander, 1968). These basic assumptions provide a starting point for research into groups, but there remains a great deal of complexity when trying to distinguish between individual behavior and social phenomenon, as Forsythe (1983) points out:

Undeniably, groups occupy a central position in the scheme of social life, but in some respects their pervasiveness is the very factor that prevents us from fully understanding them. In living most of our lives surrounded by groups, in the midst of groups, trying to get into groups, and trying to get out of groups, we can become so accustomed to them that their influence on our behavior goes unnoticed. (p. 3)

Educational Interest in Group Learning

Education is a social process in which groups are ubiquitous, and one of the most common groups we become part of at an early age is the classroom group. Throughout our educational experience we are likely to be part of many different groups, and despite our willingness to be part of them, they will have long lasting social and cognitive effects on us (Forsyth, 1983). The educational approach to learning prior to the mid-1960s was primarily that of the learner as an individual entity for instruction, but in that decade the group learning approach made its debut (Johnson, Johnson & Smith, 2007). Interest in group learning was soon bolstered by the emergence of constructivist approaches to learning that emphasized the effect of social interactions and culture on the learning process (Johnson & Johnson, 1989; von Glasersfeld, 1995).

The focus on research and application of small-groups as a learning method began in earnest in the 1970s with researchers such as David Johnson, Roger Johnson, Robert Slavin, and Shlomo Sharan. The emphasis for researchers during this time was largely on cooperative learning groups, and much was accomplished in the development of models and techniques for implementing them at all levels of education (Slavin, 1983). Interest in group learning remained strong throughout the 1980s, but the advent of the networked computer in the 1990s created a surge of enthusiasm for technology supported group learning (Koschmann, 1996) that continues to this day.

Group learning is of interest to researchers and practitioners alike because of its effectiveness for both cognitive and skill development. For educational researchers, the appeal of group learning is based in its potential impact on motivation, transfer, and critical thinking through active learning engagement (Jonassen et al, 2003; Scribner,

Baker & Howe, 2003). Practitioners find that group learning addresses professional development needs (Ellis, Hollenbeck, Ilgen, Porter, West, & Moon, 2003; Hansen, 2006), and that it is easily adaptable to a multitude of contexts and purposes. For example, group work can involve constructing an engineering model, offering recommendations on a business problem, or even developing a marketing or communication campaign (King & Behnke, 2005). This gives relevance to group learning by providing an opportunity for the learner to build skills and experiences in contexts that will be more like the real world setting:

Over the last 25 years, a substantive body of knowledge has emerged expressing the need for professional education programs to not only develop in learners the technical knowledge and skills required for professional practice, but also the practical knowledge necessary for success in dealing with the often uncertain, ill structured, and complex nature of professional practice (Woolf & Quinn, 2009, p. 25).

Summary of Group Learning in Higher Education

Groups are an integral part of our lives and are pervasive throughout education in various forms and formats. Group dynamics is the formal study of how groups form and function that began with Kurt Lewin in the 1930s. Since then, the study of groups has been effected by and had an effect on a multitude of academic disciplines. The educational interest in group learning comes from two sources that represent this learning method's diverse nature and broad appeal: (1) constructivist approaches to learning as a learner controlled activity within a social context, and (2) the development of skills that enable employees to effectively work in teams. These distinct interests should not be seen

as divergent concerns, but rather reciprocally supportive insofar as the central theoretical principle of group learning is social interdependence where individuals work together toward a common goal, a concept that is also crucial to effective teaming in the workplace.

Basis for Educational Interest in Group Learning

Theoretical Basis for Interest in Group Learning

The ambiguous nature of what it means to be a group has opened the door for researchers of group learning to apply a myriad of theoretical principles to it, depending upon their own orientation. Where some researchers focus on the whole group as the entity to be researched (Stahl, 2006), others argue that it is the individual's behavior within the group that is the basis for analysis (Johnson & Johnson, 1974; Slavin, 1983). This type of anthropomorphic debate is not new and has been ongoing since the early study of groups. At the core of the issue is whether groups have real properties or whether they only exist in the human mind (Cartwright & Zander, 1968). In either case, group learning resonates with many theorists who concur that "learning is, in its essence, a fundamentally social phenomenon" (Wenger, 1998, p. 3).

As a social situation, group learning draws heavily upon the theory of social interdependence (Bruffee, 1993; Johnson & Johnson, 1989; Slavin, 1990) as well as the cognitive developmental and socio-cultural perspectives of constructivism (Delgarno, 2001; Dillenbourg et al., 1996). Though the importance of social interaction is a critical element of cognitive development, to categorize collaborative learning as a purely objectivist approach oversimplifies collaborative group learning. Collaborative group learning is also influenced by the cognitive theories of situated cognition and distributed

cognition whose constructs recognize the significance of relevance and meaning-making upon the learning experience (Hewitt & Scardamalia, 1998).

The development of social interdependence theory. Social interdependence theory is fundamental to group learning because it describes the inter-relational and motivational concepts behind positive group interactions. Social interdependence exists when group members share a common goal and understand that their own success is tied to the actions of the others in the group (Bruffee, 1993; Johnson & Johnson, 1989; Slavin, 1990). In essence, social interdependence theory states that the structure of the goal has an effect upon the interaction occurring between participants, thereby determining the outcome of the situation (Deutsch, 1949; Johnson & Johnson, 1989). With its roots in social psychology, social interdependence theory has been used as a conceptual basis for research into many aspects of group processes. A strong point of the theory is that it approaches group processes from a systems-oriented perspective. Because it is relevant to those studying groups as wholes and to those interested in the individuals within groups social interdependence theory is accepted by many researchers. The concept of social interdependence as a system of interrelated parts is attributed to Kurt Lewin, whose own field theory was influenced by Gestalt psychology (Jones, 1998, pp. 33-34).

Gestalt theory proposes that perception is based on perceiving the whole as the summation of the parts. A group, therefore, is a whole that consists of distinct individuals. As in psychological fields, it is the strength of the interrelatedness among the members that creates the perception of a group. The strength of the group is perceived in two ways: first, within the group, the members perceive themselves as part of a group when there is a sense of behaving as a whole, and secondly, outside the group, the status

of a group is based on a recognition that the members are behaving as a group (Koffka, 1935, p. 650).

Kurt Lewin (1935, 1948) advances the concept of interdependent groups by adding that the group's interdependence is based upon the recognition of a common goal and that, once perceived, this goal acts as a catalyst to motivate the diverse individuals to work together to achieve it. The motivation to achieve a goal is based on what Lewin (1935, 1948) refers to as intrinsic motivation, an internal tension within individuals that compels them toward accomplishment of the goal as a way of diminishing this tension. Interdependence within the group derives from the collective intrinsic motivation of the individual members based on the perceived common goal.

Morton Deutsch's (1949) research on cooperation and competition extends social interdependence theory to encompass the concepts of promotive (positive) and contrient (negative) goal interdependence. Promotive goal interdependence occurs when the goals of the members are positively linked to a cooperative social condition. Contrient goal interdependence occurs when the group member goals are negatively linked by a competitive social condition. Deutsch includes a third type, no goal interdependence, which exists within an individualistic social condition where the goals of the group members are not linked at all.

Within education, the work of David W. Johnson and Roger T. Johnson has given social interdependence theory an instructional context. Johnson and Johnson (1974, 1989, 2005) encapsulate Deutsch's types of goal interdependence as instructional goal structures by explaining that cooperation occurs in an educational situation when the individual goals of the learners are so closely aligned that there is a positive correlation to

their interactions and attaining a common goal. Thus, when positive interdependence exists within a group, the group members perceive that the best way to attain their own goal is to help others attain theirs. Competition, conversely, occurs in an educational situation when the individual goals of the learners in a group have a negative correlation to attainment of a common goal. In such a situation, the individual perceives that the best way to attain his or her own goal is at the expense of others attaining theirs. An individualistic educational situation occurs when the individual learners' goals have no alignment to the goals of the other members, and the only concern is with the attainment of personal goals. At the core of Johnson and Johnson's theory is the premise that the type of interdependence within the learning group will dictate the interaction patterns among the learners and will in turn determine the outcome of the group learning situation.

Constructivism and the influence of Piaget's cognitive developmental theory. As von Glasersfeld (1995, p. 18) explains, constructivism becomes popular in the early 1970s as educational theorists and researchers begin to embrace Piaget's ideas of how children develop cognitive structures. However, while the concepts of developmental stages receive a lot of attention, Piaget's ideas concerning knowledge and epistemological principles are not being addressed. In response to this oversight, radical constructivism is conceived, whereby the term "radical" signifies an uncompromising and deep understanding of the epistemological aspects of Piaget's work (von Glasersfeld, 2005).

Piaget's background in biology strongly influences his theory of learning, which he terms "genetic epistemology" (Piaget, 1970). This theory attempts to formalize the biologically contingent process of how knowledge is acquired through developmental

stages and the organization of cognitive structures (Piaget, 1971). In essence, genetic epistemology is concerned with explaining how individuals come to know something and the progressive stages of development that are required to attain the ability to know (Piaget, 1970). The main tenet of genetic epistemology is that knowledge is constantly being constructed by the individual (Piaget, 1970, p. 77).

Constructivism embraces the idea that the individual alone is responsible for his/her thinking and knowing (von Glasersfeld, 2008). Von Glasersfeld (1995) characterizes such a construction of knowledge as a model of “rational knowing” (p. 24). Von Glasersfeld (1995) maintains that the guiding principles of constructivism are “[that] knowledge is not passively received but built up by the cognizing subject; [and that] the function of cognition is adaptive and serves the organization of the experiential world, not the discovery of ontological reality” (p. 18). The relationship between knowledge and reality sets constructivism apart from traditional theories in its view that knowledge is derived from operating in and the organization of the individual’s experiential world, not from a passive reception of information (von Glasersfeld, 2008).

In constructivism, knowledge is acquired solely through an individual’s experiences; it is not possible to create mental constructs that go “beyond the experiential interface” (von Glasersfeld, 2005, p. 11). Therefore, claims to truth are based on the contextualized experience of knowing: “Quite generally, that means that the world which we experience is, and must be as it is, because we have put it together that way” (von Glasersfeld, 2008, p. 13). Knowledge, then, according to von Glasersfeld (1989), is the organization of experiences as references to the predictability of a situation. In the epistemological sense, this organization of references is the cognitive process of

continuous comparison of experiential references to attain a predictable reality based on creating viability out of one's experiences, a principle reflective of Piaget's concept of equilibration.

Piaget (1971) conceived of equilibration as the process of cognitive development resulting from the individual's attempt to bring balance to his or her experiences.

Equilibration consists of organization and adaptation, cognitive activities which are used to eliminate the cognitive disequilibrium caused by new experiences. Organization is the cognitive activity that develops schemes, mental structures representing the external environment and actions taken within that environment (Piaget & Inhelder, 1969, p. 13).

Through the cognitive activity of adaptation, the individual adjusts to new experiences. The functions of assimilation and accommodation comprise the adaptation process. Assimilation occurs when a new experience can be matched with or converted to fit within a preexisting scheme; accommodation occurs when a new experience does not fit within existing schemes and a new scheme emerges (Piaget & Inhelder, 1969). These complimentary functions might be imposed either concurrently or separately (Piaget, 1971, 173), but the balancing function between the two facilitates the adaptation process that is essential to equilibration.

Cognitive development results from equilibration and the process of adaptation in effort to achieve stability in mental structures. As Piaget succinctly states, "Life is essentially autoregulation" (Piaget, 1971, p. 26). Piaget (1969) describes autoregulation as an ongoing process by which the individual develops more sophisticated adaptation and organization schemas. Learning occurs when assimilation of new mental stimuli into an existing scheme does not have the expected outcome, creating a mental disturbance

that must be accommodated by a new scheme to recover balance. Often, this means the broadening of a scheme to be more inclusive, leading to questions or inquiry based on reflective abstraction of existing schemes and thus the development of increasingly complex and comprehensive schemes that provide for further abstraction (Piaget, 1970).

Piaget hypothesizes that knowledge is not a mere copy of the environment, but instead it is a “system of interactions reflecting the autoregulatory organization of life” (Piaget, 1971, p. 27). This hypothesis is based on the idea that individuals are not passively influenced by their environment but are actively engaged with it and constantly at work organizing and adapting to it (Piaget, 1971, p. 31). Schemes, therefore, also include the actions taken within the external environment, and from that standpoint assimilation provides a frame of reference from which learning can progress (Piaget, 1971, p. 11). Cognitive assimilation, then, is always the starting point for knowing:

Knowing does not really imply making a copy of reality, but rather reacting to it and transforming it (either apparently or effectively) in such a way as to include it functionally in the transformation systems with which these acts are linked. (Piaget, 1971, p. 6).

In the social context, adaptation is essential because it necessitates that meaning be involved in knowing and also that to know something requires its usefulness (Piaget, 1971, p. 6). Piaget (1971, p. 180) proposes that thought is rooted in action, and the basis of intelligent thought is derived from activity with reality. Thus, thought is the product of interacting with the physical and social environment (Piaget & Inhelder, 1969, p. 49). Piaget (1971, p. 34) portrays cognitive functions as specialized organs that are part of the entire organism, not distinct from it. In a similar way, as a product of the society in which

the individual exists, the individual “contains within himself an inextricable knot of social interference” (Piaget, 1971, p. 212).

The effect of the social environment on cognitive processes is to expand the concept of viability to include the structured experiences of others, whereby one recognizes one's own autonomous construction of reality in others and the subsequent need for “intersubjective” viability (von Glasersfeld, 1995, p.127). Therefore, one's experiences are not isolated but are influenced by interaction with society and an environment filled with objects and symbols influenced by society. In this social setting individuals incorporate their own experiences and the process of viability to include the experiences and viability of others (von Glasersfeld, 1989).

As the basis for group learning, social interaction plays a significant role in the process of cognitive development because it is both a cause of disequilibrium and equilibrium (Piaget, 1971). As a result of group interactions, a “mutual adaptation” process takes place that works to establish equilibrium across multiple individual's schemes in the social construction of knowledge (Piaget, 1995). This is a second-order of viability that is established when a “piece of knowledge” is found to be viable for oneself as well as for others (von Glasersfeld, 1995, p. 120). The social learning process derives from social interactions that are dependent upon the type of relationship established between individuals. Figure 1 is a conceptual representation portraying different learning relationships and the result of social interactions on the initialization of zygote constructs. A zygote construct is a new or expanded construct of knowledge formed by the union of individuals as the result of cognitive interaction.

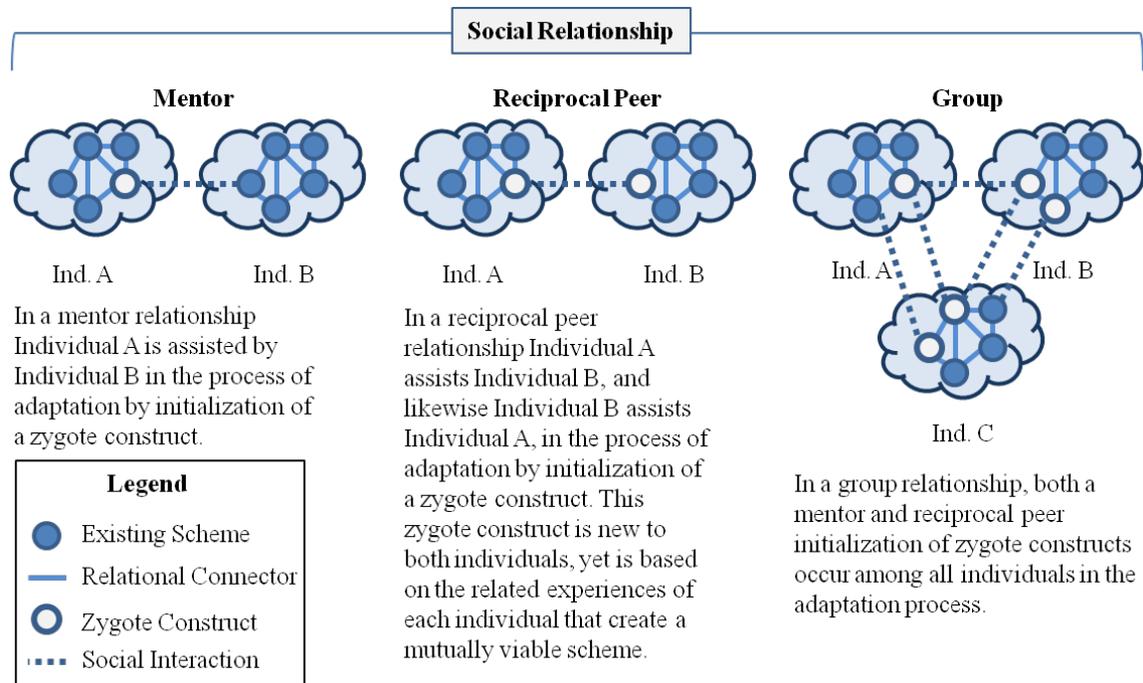


Figure 1. The role of social interactions on the initialization of zygote constructs.

Vygotsky's socio-cultural theory and the zone of proximal development. Vygotsky (1978) is credited with developing a socio-cultural approach to learning which proposes that (1) cognitive development is profoundly influenced by social interaction and culture; (2) social interaction is critical to the cognitive processes of language, thought and reason; and (3) social interaction with more knowledgeable others (peers, parents, teachers) is the catalyst for learning. Central to Vygotsky's theories is the belief that interaction with the socio-cultural environment determines the individual's intellectual values and tools, and thus affects their cognitive functions; thereby they "grow into the intellectual life of those around them" (Vygotsky, 1978, p. 88). In particular, Vygotsky (1978) emphasizes language as the primary tool for cognitive development. Language, to Vygotsky (1978), is not only a means for social conveyance of meaning, but also the primary means of cognitive function, even when the individual is alone:

The acquisition of language can provide a paradigm for the entire problem of the relation between learning and development. Language arises initially as a means of communication between the child and the people in his environment. Only subsequently, upon conversion to internal speech, does it come to organize the child's thought, that is, become an internal mental function. (Vygotsky, 1978, p. 89)

Although immersion in the socio-cultural environment is in essence immersion in the learning experience, it is through social interaction with more knowledgeable others that learning is most productive. This social influence on cognitive development is envisaged as the "zone of proximal development" (ZPD) (Vygotsky, 1978, p. 84). Basically, ZPD is the difference between what can be accomplished alone and what can be accomplished with the assistance of a more knowledgeable other. In Vygotsky's (1978) own words, "It is the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86).

The implication of ZPD for learning is that, to maximize cognitive development, instruction should be directed at the proximal level of development because it is a progressive view of mental development, whereas instruction directed at the "actual developmental level" is a retrospective view of mental development (Vygotsky, 1978, p. 87). A model for such instruction is that the learner, working with more capable others (peer, mentor, or teacher) on a task that could not be solved alone by the learner, will over time be given increased responsibility for completing the task as demonstrated by

the more knowledgeable other. Though ZPD creates an initial dependence on social interaction with peers for cognitive development, the subsequent removal of scaffolding eventually leads to independent achievement (Vygotsky, 1978, p. 90). ZPD is at its most dynamic within the context of group learning when the diverse individual perspectives and prior knowledge involved have the potential to produce an environment where all individuals are simultaneously assisting to extend knowledge and are having their own knowledge extended. Lewis (1997) points out that the existence of any number of overlapping knowledge structures in such an environment creates a greater potential for reciprocal scaffolding of knowledge.

Support for authenticity, context, and activity in collaborative group learning.

Lave and Wenger (1991) call for learning that does not separate knowledge from practice, but instead emphasizes the conditions of learning. Brown, Collins and Duguid (1989) echo this sentiment by professing that for knowledge to have meaning it must be in the context of practice. Situated cognition emphasizes the contribution of relevance to the social and physical learning context. In this theory, social interaction advances knowledge beyond the explanation of things and rests heavily upon applying that understanding in diverse, authentic situations (Lave & Wenger, 1991). Situated cognition is applied to learning in cognitive apprenticeship (Brown, Collins, & Duguid, 1989) and communities of practice (Lave & Wenger, 1991), both of which include systems of support for learning within the group context. Brown, Collins & Duguid (1989) describe cognitive apprenticeship as affording a progression from novice to expert due to a learning process that is embedded within an authentic social setting. In a similar vein, Lave and Wenger's (1991) community of practice (CoP) depicts learning and expertise-

building as occurring when individuals who share a common interest participate in assisting each other as they move from the outer peripheral of a knowledge domain and work towards mastery.

According to Greeno (1997), social interaction in the “situative” perspective amalgamates during reflection and discourse. These activities discover a shared meaning based upon group and individual experiences. “The *situative* perspective views learning to think as becoming a more effective participant in social practices of inquiry and sense-making, in which individuals develop their identities as learners and knowers” (Greeno, 1997, p. 85). Thinking, therefore, is dependent upon effective participation in a community that fosters inquiry and reflective analysis. Instruction should be designed to create an environment where activities reinforce the use of “productive inquiry and use of concepts and principles that are characteristic of subject matter disciplines” (Greeno, 1997, p. 99). In particular, the learning environment should encourage more active social participation as a way to build the relationship of the individual to the community and its activities (Greeno, 1997).

Distributed cognition furthers the idea of the cognitive effects of context and activity. In distributed cognition, a holistic view emerges in which intelligence is integrated and distributed throughout the interplay of persons, symbols, and environments (Pea, 1993). This theory claims that the embodiment of meaning is not based solely in one's head, but extends to objects, artifacts, and activity (Cole and Engeström, 1993; Pea, 1993). Hewitt and Scardamalia (1998) explain that in distributed cognition knowledge “is spread over the entire situation, and it cannot be reduced to chunks of cognition that are located in the head or in an object” (p. 80). Pea (1993) asserts that intelligence exists

because of human activity insomuch as “intelligence is accomplished rather than possessed” (p. 49) and that human activity has both social and physical dimensions across which cognition is distributed. Activity that adds meaning is in itself embedded in various other activities, all ebbing and flowing in an interconnected network of activities overlapping in time and space that works together to create meaning at that moment (Cole & Engeström, 1993). Such interconnection supports the concept that “All cognition is fundamentally situated and distributed” (Hewitt & Scardamalia, 1998, p. 77); thus, “... thinking occurs as much among as within individuals” (Cole & Engeström, 1993, p. 42).

The situated and distributed theories of cognition are reminiscent of the pragmatic theories of John Dewey where the role of experience in education is both cognitive and contextual. Dewey (1938) suggests that the educator’s primary responsibility is to (1) be aware of and shape experiences that are authentic, (2) recognize within a situation the relevance to authentic contexts that provide growth experiences, and (3) become proficient in utilizing the elements of the learning context and environment in creating authentic experiences (p. 35). Hence, the educator should be mindful that “every experience influences in some degree the objective conditions under which further experiences are had” (Dewey, 1938, p. 30). Therefore, a learning experience laden with authenticity and social interaction serves both the learner’s present and future learning process (Dewey, 1938, p. 91).

Summary of theoretical basis for interest in group learning. The interest in group learning by educators is based in the theoretical principles concerned with the social aspects of learning associated with interdependence theory and constructivism as well as several cognitive theories that seek to explain how the context of the learning

environment affects learning in group situations. Social interdependence theory evolved as an instructional theory from social psychology and has become instrumental in understanding the positive interactions and motivations within groups. This theory asserts that there is a relationship between learning goals and learner interactions. It posits that positive social interdependence results in group members helping one another achieve a common goal and thereby also impacts the learner's effort to achieve, interpersonal relationships, and psychological health. Conversely, negative interdependence leads to group members striving to reach only their own goal and subsequently hindering others' efforts in reaching theirs.

The constructivist theories address how an individual develops cognitively based on his or her own construction of knowledge through social interaction. Constructivism avows that knowledge is not acquired via passive reception, but rather in an ongoing process of knowledge construction that results from external social experiences. From the cognitive developmental perspective, knowledge is the organization of experiences as a result of the individual's constant attempt to attain cognitive balance. Cognitive development occurs when the individual encounters new experiential stimuli that disrupt this balance and as a result the individual is forced to develop new organizational schemes to support the new experience, thereby returning to cognitive balance. Social interaction has the a significant impact on the learner because it is instrumental in initiating a disruption and creating a balance in cognitive processes.

The socio-cultural perspective states that learning is derived primarily from social interaction; thus, language has primacy because it is essential to cognitive development. Interaction with more knowledgeable others is central to the learning process because of

the support the learner obtains as he or she ascribes to achieve beyond his or her own development level and is assisted by the more capable mentor, peer, or teacher. This concept directly affects instruction because it shifts the focus from the actual developmental level of the individual to possibilities of instruction at a higher achievement level. In a group learning environment, interacting with more knowledgeable others produces a learning situation where the layers of development and knowledge become very dynamic as group members engage in mutually reciprocal mentoring.

Cognitive theories of learning are also concerned with social interactions in the learning process, but further address the need for authentic participation in relevant activities within a community of inquiry as a means of advancing knowledge. Approaches to situated cognition help explain the role that relevancy plays in creating a context by which social interactions can be grounded in authentic experience. In addition, approaches to situated cognition explain the process through which individuals are supported within a group learning context as they progress from novice to mastery of knowledge. Taking the concept of context to another level of abstraction, distributed cognition provides a theoretical basis for how the objects, environment, and activities of society affect cognitive development, particularly how these are used in the mediating process as individuals within a group engage in the process of meaning-making.

Practical Basis for Interest in Group Learning

For some, the most compelling argument for using group learning is that it can be used to develop the group work skills that will be needed by the learner during his/her professional career. Here again, group learning appeals across academic disciplines

because of the ubiquity of group work in the workplace. Employers are seeking job candidates who are prepared to enter and be effective in a team-based work environment (Chapman et al, 2006; Hansen, 2006). The role of higher education in preparing learners for the work place is not a trivial matter to researchers King and Behnke (2005) who profess that:

Those who lack either the experience in this learning context or the skills associated with group interaction, or who do not positively value the role of a team member or team leaders, will be at a major disadvantage in a society stressing and valuing cooperative work. Central to this argument is the assumption that education should prepare students for professional life. (p. 57)

Group learning in higher education is more than a way to build individual and group skills; it is a prerequisite for success in an individual's future career. "Helping college students develop as professionals who are able to deal with real-world problems in complex and dynamic situations, and who can make reasoned and reflective decisions, is one of the essential goals for higher education" (Choi & Lee, 2009, p. 100). Placing learners in settings comprised of teams working on projects gives them the opportunity to learn how to work in the "real-world" (Chapman & Auken, 2001). Among other things, the multifaceted nature of projects helps prepare students for their professional careers. The complexity of working in a group on a project offers some semblance of realistic situations and provides practice in communication, group processes, and technical skills. As Tarricone and Luca (2002) assert:

Skills such as problem solving, communication, collaboration, interpersonal skills, social skills, and time management are actively being targeted by

prospective employers as essential requirements for employability. Employers consistently mention collaboration and teamwork as being a critical skill, essential in almost all working environments (p. 54).

When designed appropriately, a group learning environment can be a means for a learner to participate in building knowledge while also developing life skills and experiences that will be usable in the marketplace (Scardamalia & Bereiter, 2003; Tarricone & Luca, 2002). In particular, because soft-skills are of significant value to multidisciplinary teams, the instruction should be designed to “facilitate the learning of competencies such as leadership, problem solving, communication, and people skills in meaningful, authentic, and transferable ways” (Brill, Bishop, & Walker, 2006).

Summary of Educational Basis for Interest in Group Learning

The theoretical basis for interest in group learning draws heavily from social interdependence theory, Piaget’s cognitive developmental theory, and Vygotsky’s socio-cultural theory. Social interdependence theory describes how interactions affect the relations and motivations of individuals in a learning group. Constructivist theories have influenced interest in group learning because they provide a basis for understanding how an individual constructs his or her own knowledge and the supporting role of social interaction in the learning process. In addition, cognitive theories of learning expand the precept of socially constructed knowledge in collaborative group learning environments by addressing the concept of social context and provide an understanding of the significance of relevancy to activity and meaning making.

The practical aspects of group learning also add to its appeal. One of the most compelling reasons for using group work as a learning approach is the need to prepare

students for a workplace that is laden with groups. Employers are seeking candidates with skill and experience working in groups. Higher education can facilitate the development of these skills through realistic group learning activities that provide practice in communication, management of group processes, and problem solving. Though the drivers behind the interest in group learning may be different for theory-based and practical-based implementation, the two motives are actually closely related in their need for participation in authentic group learning activities.

Research Regarding Group Learning

Research on group learning has reported a wide range of benefits to learners' cognitive and socio-cognitive development. Research into group learning gathered momentum in the early 1970s and continues to garner interest from a wide variety of disciplines across all levels of education (Slavin, 1996). The popularity of group learning and the subsequent plethora of research have compelled researchers to develop highly robust meta-analysis of group learning findings and methods. Among these, the most comprehensive compilations have been produced by cooperative learning researchers David W. Johnson and Roger T. Johnson (1974, 1989, 2000) and Robert E. Slavin (1983, 1990). The effects of group learning on student academic achievement has been the primary focus of group learning research (Johnson & Johnson, 2000; Slavin, 1996), and the research has to a large extent confirmed the benefits of group work based on cooperative goal structures over that of competitive or individualistic ones (Johnson & Johnson, 1989). However, other outcome areas that have been studied include intergroup relations, mainstreaming, ethnic relations, and self-esteem (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Sharan, 1980; Slavin, 1980).

Cognitive and Socio-cognitive Benefits of Group Learning

Johnson and Johnson (1999), in noting the evidence regarding the positive outcomes of cooperative group learning, state, “This is so well confirmed by so much research that it stands as one of the strongest principles of social and organizational psychology” (p. 72). From a meta-analysis of research focused on group learning that spanned decades as well as diverse disciplines and settings, researchers have consistently found evidence of significantly higher achievement in problem-solving activities and increased group productivity when groups worked cooperatively (Johnson & Johnson, 1989; Johnson, Johnson & Smith, 2007). These compilations of research studies (Johnson & Johnson, 1989; Johnson, Johnson, & Smith, 2007) find that group learning is especially beneficial to problem solving that requires conceptual and complex tasks by affecting the learner’s: (a) willingness to take on and persist in difficult tasks, (b) long-term retention of what was learned, (c) use of higher-level reasoning (critical and creative thinking), (d) ability to transfer what was learned to other situations, and (e) work satisfaction.

Research studies also show that group learning environments have an impact on how students interact and behave in learning situations by positively impacting learners’ social adjustment, development of effective communication skills, motivation, and autonomous moral judgment (King & Behnke, 2005). For instance, when groups are working cooperatively, there is less stress and anxiety because learners feel more secure and trustful. Such a positive learning environment means that communication is more open, and freedom of interaction leads to more on-task behavior and peer mentoring (Johnson & Johnson, 1989). Additionally, meta-analysis of group learning methods and

research (Johnson & Johnson, 1974, 2000; Slavin, 1983, 1990) reveals that heterogeneity, intergroup relations, and diversity all have positive effects on the learner's experience. Thus, Slavin (1983) concludes, "Achievement is not the only important outcome of schooling. Schools also play a critical part in the socialization of students to appropriate adult roles and behavior" (p. 17).

Though the research results in group learning have shown positive benefits to both cognitive and non-cognitive development, inconsistencies among the results have prevented them from being widely accepted as generalizable (Slavin, 1983). Slavin (1996) proposes that even with the volume of research supporting the positive effects of group learning on academic achievement, motivation, attitudes, and social skills, a great deal of uncertainty remains around predictability and about what specific conditions will produce the desired effects. This lack of consistency and clarity may have much to do with the diverse methods of implementation and even the differing subject matter of varied research studies (Johnson & Johnson, 2004; Sharan, 1980). Perhaps even more troublesome is the failure to measure individual achievement as a dependent variable in a consistent manner (Slavin, 1983). Rooted in the issue of exactly what is meant by achievement and how it is measured, the discrepancies among achievement results have been a major criticism of group learning research (Slavin, 1980). In considering the mixed results of group learning research, Slavin (1983, p. 13) suggests that to have a more complete understanding some unresolved questions need to be addressed, namely: (1) What are the effects of group learning on long-term retention? (2) How does group learning affect individual students? and (3) Is group learning more effective for some subjects?

Though they are strong advocates for the benefits of group learning, Johnson and Johnson (2004) agree that the inconsistent results regarding achievement are problematic. In many cases the studies involve hybrids of group structures that depend upon the constraints of the research methodology. In addition, Sharan (1980) suggests that contextually the premise of structure as a variable must consider the entirety of the learning environment and not just the specific outcome being observed. Sharan says that this is especially important since group learning has such a wide range of possible learning contexts, from the highly structured approaches of cooperative learning to the highly unstructured approaches of open classroom groups.

Modeling the Outcomes of Group Learning

While the literature is replete with studies on group learning, few have modeled the outcomes of group learning as coherently and comprehensively as researchers David Johnson and Roger Johnson (1989). According to Johnson and Johnson, with the theory of social interdependence as a foundation, the essential elements that govern the success and cooperation of a group include: (a) positive interdependence, (b) individual accountability, (c) promotive interactions, (d) social skills, and (e) group processing. When present, these essential elements will most likely affect the outcomes of group learning in three areas: (1) effort to achieve, (2) positive relationships, and (3) psychological health. In Johnson and Johnson's (1989) model, positive interdependence occurs when individuals perceive that the only way to reach their own goals is when others with whom they are cooperatively linked reach theirs. This perception transfers directly into how learners in a group interact; thus, positive or promotive interaction

happens when individuals encourage each other to complete tasks to reach the group's goals.

In contrast, consider the effects of contrient (negative) interdependence and no interdependence. Contrient interdependence produces the negative effects of oppositional interaction where, to reach their own personal goals, individuals hinder each other's efforts to complete tasks. When no interdependence is present, no interaction happens, and individuals act independently of one another to achieve their individual goals (Johnson et al., 2007). The basic premise regarding the outcomes of positive interdependence, then, is that the benefits associated with group learning outcomes are manifest as a result of the positive interpersonal relationships that develop.

Johnson and Johnson (1989) claim that the positive nature of interpersonal relationships resultant of positive interactions is rooted in mutual caring where morale and responsibility flourish and increase the individual's productivity because of a commitment to the success of others in the group. Thus, positive interdependence in a group learning environment positively influences psychological health and social competence and improves self-esteem as each member recognizes his or her own contribution to the group's success. Participation in a group learning activity that develops positive interdependence causes individual social skills to improve as learners communicate more effectively and work together toward a common goal (Johnson & Johnson, 1999).

Types of Group Learning

The term group learning can be ambiguous (Towns, Kreke, & Fields, 2000), but researchers Johnson and Johnson (1999) have categorized a few types of groups

commonly used in education as pseudo learning groups, traditional learning groups, and cooperative learning groups. In addition to this list is the collaborative learning group (Crook, 1995). In the following paragraphs, these types are used to highlight the different characteristics that can exist between groups based on the criteria of designed structure, interdependence, and reward.

In a pseudo learning group (Johnson & Johnson, 1999), learners are assigned to work with others, but they are not highly motivated or required to work effectively as a group for an extended period. There is usually little incentive to work together, and learners are concerned primarily with their own success. In this case learners would probably do better working alone and the sum of the whole is less than the potential of the individual members.

Traditional classroom learning groups are described by Johnson and Johnson (1999) as groups of learners who work together but know that they will be evaluated and rewarded as individuals. In these types of groups, some knowledge sharing does occur; however, some learners choose not to participate while others may feel exploited and refrain from participating fully. As a result of this lack of equity in responsibility, the sum of the whole is greater than the potential of some individuals but less than that of others who would achieve more on their own.

Cooperative learning groups (Johnson & Johnson, 1999, 2004) are groups of learners working together to accomplish shared goals who understand that there is a common reward for all. In cooperative learning groups, a high level of discourse encourages knowledge sharing, and individual contributions are required and monitored. The result is that the sum of the whole is greater than what the individual members could

have achieved alone. Johnson and Johnson (1999) describe three sub-types of cooperative groups: (1) formal groups, where learners work together on an assignment, (2) informal groups, where learners engage temporarily to complete short-term assignments, and (3) base groups, where learners are part of a long-term, heterogeneous group that provides ongoing support of academic progress.

How well any small group performs depends on how it is structured. Seating people together and calling them a cooperative group does not make them one. Study groups, project groups, lab groups, homerooms, and reading groups are groups, but they are not necessarily cooperative. Even with the best of intentions, teachers may be using traditional classroom learning groups rather than cooperative learning groups. (Johnson & Johnson, 1999, p. 68)

In a collaborative learning group, the learners work together in much the same way as in cooperative learning (Johnson & Johnson, 2004) but with less structure and with an emphasis on informal roles and task assignments (Crook, 1995). Learning derives from the agreement on and attainment of a common goal that is a result of interpersonal dialogues and interactions (Crook, 1995; Scardamalia & Bereiter, 1994). Therefore, the end product is student directed and is an amalgamation of the diversity of individuals within the group. As higher level cognitive processes are engaged, the sum of the shared creativity and productivity of the group is exponentially greater than what the individual members could have achieved alone (Stahl, 2006).

The definitions of group learning offered by Johnson and Johnson (1999) represent one attempt at categorizing the many approaches to group learning, and in practice any number of variations and combinations of group types and group activities

are utilized. As a result, the group learning literature can be imprecise. For instance, Towns et al. (2000) declare, "...we use 'small-group learning' to acknowledge that groups may work cooperatively or collaboratively depending upon the type of task and how it is constructed by the teacher" (p. 111). Other researchers find meaningful differences in social interactions, structures, and goals between types of group learning approaches that require making more precise distinctions (Crook, 1995; Johnson & Johnson, 2004; Koschmann, 1996, Slavin, 1990). This initial portion of the literature review assumes a "generic" understanding of group learning to address the overall theoretical and practical foundations of group work. Later in this review, group learning distinctions will be revisited and expounded upon (see p. 39).

Summary of Research Regarding Group Learning

Group learning is a major topic of research, and a large body of evidence supports its benefits to cognitive and socio-cognitive development. This research has reported that group learning significantly improves achievement and positively impacts problem solving involving complex tasks. Additionally, group learning has been shown to impact learner's socio-cognitive development positively through relationship building that supports interactions with other group members. However, the benefit derived from group learning is highly reliant upon the type of interdependence that develops among the learners in a group as this drives their quality of interactions and relationships. This relationship of learner interdependence is best exemplified in how positive interdependence directly affects interactions and, thereby, the learners' effort to achieve, their interpersonal relationships, and their social well-being.

Research into group learning has found that the benefits associated with group learning are strongly aligned to goal interdependence and individual accountability. However, the exact conditions that produce specific benefits are elusive to researchers of group learning. Consequently, the benefits of group learning are not widely accepted and this has been attributed to the lack of consistency in defining and measuring academic achievement, the varying design methodologies, and the dynamics of the group learning context themselves. In particular, no commonly accepted typing of groups exists, and the implementation of any given method is subject to a wide array of variances. Not least among these variations is the interpretation and definition of the characteristics of “group learning” from researcher to researcher.

Collaboration as a Desired Method of Group Learning in Higher Education

Up to this point, this review of literature has been concerned with establishing the foundation upon which the use of group learning in higher education is built. Moving forward, the attention of this review will narrow to focus on collaborative group learning as an instructional approach that is increasing in popularity. The surge in interest in collaborative group learning over the past decade is due to technological advances and theoretical shifts that are complementary (Jones, Dirckinck-Holmfeld, & Lindstrom, 2006), bringing collaborative group learning to the forefront of research and practice as a “paradigm shift” in education (Koschmann, 1994).

With or without technology, collaborative group learning is popular in higher education and is often implemented as an exercise among small groups of students working on an ill-structured problem outside of the classroom with little direct teacher supervision (Volet & Mansfield, 2006). This popularity is due in part to the adaptability

of collaborative group learning to the learning context and to its being well suited to simulate real world experiences (Schellens & Valcke, 2006). Collaborative group learning supports both theoretical and practical interests as discussed previously (see p. 9) and also provides an enhanced learning experience that is centered on participatory inquiry (Sfard, 1998), critical and creative thinking skills (Newman, Johnson, Webb, & Cochrane, 1997), and creation of a shared artifact (Stahl, 2006). Collaborative group learning is quintessentially student-directed, informal and project-oriented (Crook, 1995). Such attributes of social learning are highly desirable, yet, they are also highly susceptible to the negative effects that may accompany certain group dynamics and individual learner attributes.

Defining Principles of Collaborative Group Learning

The literature lacks a consistent definition of collaboration, and it is often vague about the difference between collaborative group learning and other types of group learning, especially cooperative group learning. Some researchers point out that the differences between the two approaches are minor enough to make them interchangeable and synonymous, or even generic (Johnson & Johnson, 2004; Towns et al., 2000). Other researchers, however, are adamant that distinctions should be made in light of the unique affordances of collaborative group learning. The primary difference, according to Crook (1995), is that collaborative group learning has more interpersonal activity and a less structured assignment of responsibility than can be found in cooperative group learning. This structural difference becomes most apparent in the emphasis that collaboration gives to the functions of learner-led discourse (Scardamalia & Bereiter, 1994) and shared goal attainment (Stahl, 2006).

The defining elements of collaborative group learning that are most consistent throughout the literature are goal interdependence, interaction, informal structure, and shared artifact creation (Bruffee, 1993; Crook, 1995; Stahl, 2006). Though collaboration must possess all of the functional characteristics of cooperation, procedurally it rejects the strictures of cooperative methods for a more dynamic approach. In this way collaboration is a process of inquiry that is made possible only through participation and interactivity of the learners with the problem, the solution, and each other. Furthermore, these defining elements move learning toward an optimal performance objective inasmuch that it advances participants to higher cognitive and social levels.

Characteristics of Collaborative Group Learning

Crook (1995) describes the key characteristics of collaboration as shared goals, articulation of thoughts, negotiation (through conflict), and co-construction of artifacts in the context of an informal structure of social interaction and discourse. According to Scardamalia and Bereiter (1994), collaborative learning provides a way of scaffolding for progressive problem solving where the process of knowledge building characterizes both those progressing in expertise as well as those working outside their competency level. Lave and Wenger (1991) conceptualize this process in terms of how a peripheral participant interacts with and is mentored by other members of the community of practice as they become insiders. Collaboration requires that learners within such an environment engage in effective negotiation of meaning first to understand the problem and then to derive a solution. The common language that results is a product of meaning-making that is cultivated by informal interactions and discourse (Hung, 2002). Hence, collaboration is a participatory process of inquiry that leads to the building of knowledge and creates a

learning environment that focuses on developing the greater collective intelligence. This process requires a collective sense of responsibility through the understanding that each participant plays a part in the process of knowledge advancement (Scardamalia & Bereiter, 2003).

In the collaborative group learning paradigm, knowledge is constructed through the process of knowledge building and development of a shared understanding among learners. This process is greatly reliant upon an informal social setting that encourages participation through discourse and social interactions. In this paradigm, the relationships among learners are characterized by interdependence and a collective responsibility to the communal advancement of knowledge. The context of learning in this paradigm is based on an informal structure that stimulates learner-directed inquiry; therefore, the role of the instructor is to encourage discourse and mentor participation in communal knowledge advancement. The relationships that exist among the characteristics of a collaborative group learning environment are shown in Figure 2.

Characteristics of a Collaborative Group Learning Environment

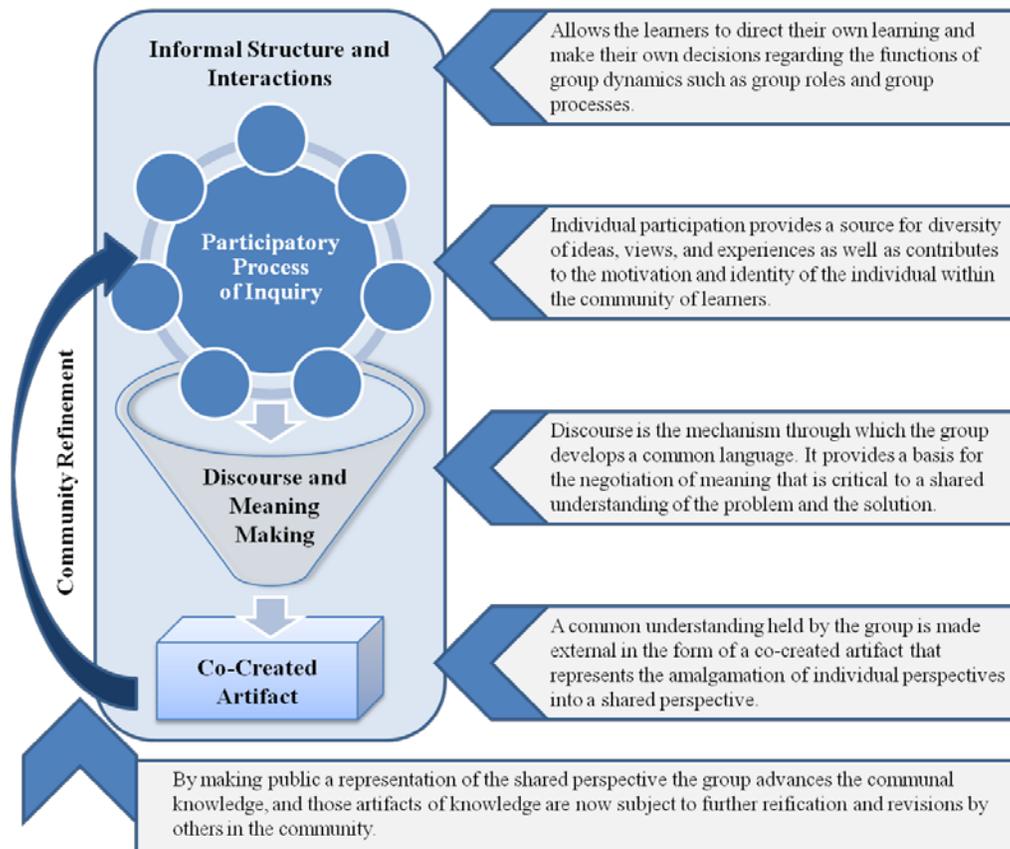


Figure 2. A conceptualized model of characteristics in the collaborative process.

Informal Structure and Interactions

What most distinguishes collaboration from other forms of group learning is its informal nature where the types of communication that are allowed to take place are based on student-directed methods and goals (Koschmann, 1994; Scardamalia and Bereiter, 1994). The informal structure of collaboration intends the discussion be learner-led and free of confining direction, thereby leaving it open to the free flow of inquiry. Bruffee (1995) maintains that the informal structure of collaboration encourages learners to question the authority of knowledge and to seek to find their own answers and, just as importantly, form their own questions. Further support of this view comes from Scardamalia and Bereiter (1994) who point out that discourse within the typical

educational setting is flawed because the questioning itself is focused on the teacher's goals; therefore, they become the chief influencer on the process of inquiry. The learner is left simply with the choice to participate or not in the conversation. Conversely, the informal structure of collaboration allows the learner to follow his or her own path to understanding.

The social interactions that arise as a result of the informal structure of collaboration are important because they encourage discourse, the basis for negotiation among learners that drives shared inquiry and produces shared goals. It is by way of informal social interaction among learners that the group engages in the process of embodiment and reification of meaning where mental models are created, restructured, and tuned through individual perspective making and negotiation toward a shared meaning (Pea, 1993). One research study (Christie, Cassidy, Skinner, Coutts, Sinclair, Rimpilainen, & Wilson, 2007) finds that the informal structure of collaboration fosters interactions characterized by participants listening to and respecting the ideas of others and developing a commitment to reaching a shared understanding.

In their research on group learning, Towns et al. (2000) also find that learner perceptions are dependent upon interactions that lead to the formation of relationships that in turn strengthen the mutual commitment to shared goals. Collaboration, then, is dependent upon social interactions that take place in sound social spaces where "open dialogue and social interaction are possible, enabling cognitive processes such as elaborating, questioning, and defining to take place, all of which are necessary for the social construction of knowledge and competence building" (Kreijns, Kirschner, Jochems, & Buuren, 2004, p. 156). Collaborative group learning emphasizes social

interactions that produce a feeling of community that fosters interdependence, facilitates peer mentoring among learners, and supports the learner's process of knowledge construction (Dalgarno, 2006; Towns et al., 2000).

Social interactions play another distinct role in the collaborative group learning environments as the means for supporting the functions of group dynamics and the development of a sound social space (Kreijns et al., 2004). Kreijns et al. (2004) defines a sound social space as being “characterized by effective work relationships, strong group cohesiveness, trust, respect and belonging, satisfaction, and a strong sense of community. A sound social space determines, reinforces, and sustains the social interaction that is taking place among the group members.” (p. 157). Informal social interaction affects the collaborative process by setting the stage for determining how well the group will function, especially regarding (1) the establishment of motives and commitment to a common goal (Lewis, 1997), (2) the division of tasks (Lewis, 1997), (3) the level of participation and diversity of roles (Collis & Margaryon, 2004), and (4) support for the underlying socio-emotional issues affecting group formation and processes (Kreijns et al., 2004).

Participatory Process of Inquiry

Collaboration is by nature a participatory process. In collaborative group learning environments, the participants act as catalysts for sharing of knowledge and create a mechanism for inquiry. Overall, the focus on solving a problem contributes to the collective knowledge of the group (Koschmann, 1996). Collaboration represents a shift in perspective away from the individual acquisition of knowledge to a committed engagement in socially constructing knowledge that is more aligned with the pursuit of

scientific progress rather than pursuit of absolute truths (Bereiter, Scardamalia, Cassells, & Hewitt, 1997). However, “This collective potential can only be realized if each member of the community is aware of the knowledge of others and can capitalize on that [knowledge] by offering and receiving help from others” (Lewis, 1997, p. 211). In other words, collaboration requires that learners participate in and contribute to a process of inquiry that is based upon communal knowledge advancement and individual responsibility (Hewitt & Scardamalia, 1998).

Historically there have been two opposing instructional methods of learning. Sfard (1998) refers to these as metaphors of learning and describes them as the acquisition learning metaphor and the participatory learning metaphor. In the acquisition learning metaphor, a single expert guides the learning and controls the learning environment. This learning approach could be characterized as a 1:N relationship of knowledge distribution. In contrast, the participatory learning metaphor depicts learning as a distributed function within the group and can be characterized as a N:N relationship of knowledge distribution. These two metaphors of learning distribution are tuned further by Paavalo, Lipponen, and Hakkarainen (2004) who assert that acquisition learning is merely filling the “container” with knowledge. Participatory learning, alternately, is a process of constructing knowledge through participating in social contexts and shared activities.

Scardamalia (2002) professes that in an acquisition-centric educational system little opportunity exists to make students more responsible for their own learning, and that this condition will not change until the structure of inquiry is changed. The acquisition-centric learning environment is described as one in which learners are

required to go through the process, but they do not have to engage in the transfer of learning or contextualization of the learning outside the classroom. Scardamalia (2002) describes an acquisition-centric educational system as one composed of “Teacher A” and “Teacher B” models. The “Teacher A” model views learning as a byproduct of doing schoolwork. The “Teacher B” model views cognitive responsibility as a requirement for the teacher, but not necessarily a requirement for the students. Both models are fundamentally based on a theory of repetitive learning task completion, and neither gives the learner much responsibility in the learning process.

Conversely, collaboration transforms the process of inquiry from the passive reception and recording of data into a participatory process of inquiry where knowledge and knowing are derived from a social group’s relationship to itself, its situational context, and the learning activities in which it engages (Paavalo et al., 2004). By actively participating in collaborative activities that hone their critical thinking and reasoning skills, learners develop their own process of inquiry and take responsibility for their own learning (Bruffee, 1995). Law (2005) claims that participating in collaborative knowledge building changes the individual’s process of inquiry from interactions that are based in sharing and comparing to higher level thinking that involves negotiation and shared meaning. Researchers Bereiter et al. (1997) describe the transition to participatory inquiry in a study of 17 sixth-graders that spanned nearly three months. During that time the researchers found that the characteristics of inquiry changed from being primarily a reflection of personal interests to becoming more inclusive and dynamic as students sought mutual advances in understanding and broadened the use of research resources.

An individual understands himself or herself in context of the social groups in which he or she participates (Hung, 2002), and participation in collaborative group learning is a purposeful act. The decision to participate is a product of the learner's intentionality and motivation that is based upon his or her ability to identify with the goals of the group, be it academic or otherwise (Bereiter & Scardamalia, 1989). In the context of group dynamics, the relationship and interactions within the group are governed by shared meanings that bring uniformity to the group and are arrived at through interactions and relationships. The socially negotiated aspect of participating in the process of inquiry becomes crucial to a group's function because it gives the individual and the community an identity (Hung, 2002). In terms of becoming a community of learners with shared understanding, Wenger (1998) characterizes identity as the process of changing who we are, a concept that is supported by researchers of group dynamics (Cartwright & Zander, 1968).

Discourse and Meaning Making

Collaboration thrives on discourse. In the context of society as a whole, individuals express their ideas through their interaction with others and come to a common understanding. Similarly, in a collaborative group learning context, knowledge is accepted as such based on the level of agreement that is attained within the community of learners through discourse and meaning making (Bruffee, 1993). It is important then, that a collaborative group learning environment foster discourse that encourages public articulation of thoughts, allows conflict to move toward negotiation, and supports convergence of meaning (Crook, 1995). Collaboration depends upon the establishment of a common language in order to set a common goal (Lewis, 1997). Likewise, a common

language is necessary for making meaning of the objects and contexts that are part of the collaborative group learning environment (Pea, 1993).

The informal, participatory context of discourse in collaborative group learning allows learners to negotiate a common understanding and facilitate learner-led determination of both the questions and the solutions (Bruffee, 1995; Hung, 2002; Scardamalia & Bereiter, 1994; Schellens & Valcke, 2006). This accomplishment is made possible through iterative discourse that is constantly at work dynamically balancing the perceptions, interactions, and relationships of the group. Therefore, the nature of discourse and how it is allowed to progress play a primary role because censorship of communication dictates what a learner is allowed to know, and in discourse inquiry moves towards a collective construction of knowledge (Brown & Duguid, 1991; Scardamalia & Bereiter, 1994).

Stahl (2000) explains that the cycle of personal understanding is internally mediated; however, it is not always possible to solve problems individually. Collaborative meaning making occurs in a social context. Participation in this social process requires the explicit articulation of ideas and beliefs in the public arena. This public expression of perspective moves the process into the cycle of social knowledge building, where several individuals can participate in a collaborative exchange that further refines and extends the topic as it moves toward a convergence of shared understanding. The overall process brings together both personal and group perspectives in that “If the negotiation of the different perspectives does result in acceptance of a common result, then such a result is accepted as *knowledge*” (Stahl, 2000, p. 72).

With discourse central to the effectiveness of collaborative group learning, the analysis of such interactions needs to consider the level of cognitive discourse (Newman, Johnson, Webb & Cochrane, 1997; Gros, 2001; Stahl, 2006). Scardamalia and Bereiter (1994) assign collaborative knowledge building discourse into three categories, which: (1) focus on problems and depth of understanding, (2) are decentralized and open with a focus on collective knowledge, and (3) encourage productive interaction within the larger community of inquiry. In an ethnographic study of 28 students using activity theory as the basis for design, Aalst and Hill (2006) analyze the structure of knowledge building discourse by combining various forms of computer-mediated communications with different classroom activities. The findings show a significant impact on the nature and outcome of knowledge building discourse in the group interactions. However, other evidence suggests that collaboration was undermined because students did not necessarily understand or accept the goal of advancing communal knowledge.

In another study exemplifying both the dynamics of learner-led discourse and discourse as a measure of cognitive development, Stahl (2006) painstakingly analyzes three hours of videotaped collaborative interactions between middle-school students engaged with rocket simulation software. Stahl points to a “collaborative moment” when the discourse departs from the teacher-led dialogue and becomes student directed. The collaborative discourse is characterized by sequential turn taking by the participants to express their ideas, developing a common understanding of the problem, and negotiate consensus for the solution. Most striking about this research into discourse is that most of the collaborative discourse was derived through “utterances” of only a few words that embodied both the situational and relational contexts. This discussion-based type of

knowledge object reinforces the view that artifacts, as representations of cognitive development, can take both a physical and a cognitive form (Scardamalia & Bereiter, 1994; Stahl, 2006).

Co-created Artifacts

A key component in the collaborative process is the manifestation of ideas and goals by working on something “together” and producing an observable artifact (Stahl, 2006). As an educational activity, collaboration does not simply focus on task completion but instead advances knowledge through distributed expertise as observed in student-created artifacts that serve as mediators of distributed cognition (Hewitt & Scardamalia, 1998). An artifact is an explicit representation of a shared perspective and, as such, is not merely an act of choosing the most appealing solution from pre-existing choices, but through negotiation and consensus building a solution evolves into “a mutually acceptable status for publication” (Stahl, 2006, p. 178). Therefore, the co-creation of artifacts derives from externalizing the individual perceptions to the group and then negotiating the group perceptions to establish a common ground evidenced in the shared creation of an artifact (Stahl, 2006). Stahl points out that the individual cognitive process is the starting and ending point for constructing knowledge, but he emphasizes that individual knowledge is so interconnected with the social process that it is difficult to distinguish accurately between what is individual and what is group cognition.

The relationship between the learner and how the learner comes to know something is addressed by the co-creation of artifacts (Scardamalia & Bereiter, 1994). It is an observable validation of cognitive activities that have brought together individual perspectives to create a shared perspective. In this regard co-created artifacts are not

limited to physical manifestations, but like physical artifacts, ideas and concepts are real objects that are subject to inquiry and improvement (Bereiter, 2002; Scardamalia & Bereiter, 2003). Whether physical or cognitive, a co-created artifact appears when the negotiated understanding of the group elevates a topic to the status of knowledge by making it external and explicit for others to see and thereby to begin anew the process of meaning refinement (Stahl, 2006).

Stahl (2000) points out that this knowledge, now manifest as a co-created artifact, is not absolute and is subject to further refinement resulting from subsequent iterations of the collaborative knowledge building process. Scardamalia and Bereiter (1994) provide an example from their research of this cycle of knowledge refinement through reification of artifacts. In the example, two learners involved in a medieval history class are reviewing existing artifacts created by other learners about the subject of castle defense, but are not satisfied with the explanation of how the castle defense mechanisms actually work. This artifact review spawns an interest in developing simulations of the physical properties and systems of the defense mechanisms in question to gain a better understanding of them. The subsequent refinement of knowledge artifacts not only broadens interest and participation in the inquiry but generates new artifacts that include explanations based on the laws of physics that were outside of the original context.

Community Refinement

As an educational approach, community refinement occurs in context of collaborative knowledge building where the development of knowledge within a community is emphasized (Aalst & Hill, 2006). Bereiter et al. (1997) contend that such community refinement and knowledge building represent a shift in perspective away

from the individual cognitive processes to communal advances in knowledge. Through interaction and problem solving, the concept of what is known remains in a state of flux dependent upon retesting, redefining and hypothesizing by the entire community (Scardamalia & Bereiter, 1994). Furthermore, in a world where knowledge creation and innovation are pervasive, community refinement addresses educational needs by actively participating with others to advance continually and to adapt what is known through the process of inquiry:

Knowledge building may be defined as the production and continual improvement of ideas of value to a community, through means that increase the likelihood that what the community accomplishes will be greater than the sum of individual contributions and part of broader cultural efforts. Knowledge building, thus, goes on throughout a knowledge society and is not limited to education. (Scardamalia & Bereiter, 2003, p. 1371)

Therefore, what is meant by collaborative knowledge building differs from other constructivist methods in that this approach focuses on the continual improvement of ideas through social interaction, as opposed to just the sharing of information in a social setting (Lai & Law, 2006). In that sense, collaborative knowledge building occurs as the whole community, novices and experts alike, constantly add to the collective knowledge of the whole (Koschmann, 1996; Scardamalia & Bereiter, 1994). Generally, a collaborative knowledge building community can be any group committed to advancing the communal knowledge, while learners assess and direct their own knowledge needs (Hewitt & Scardamalia, 1998).

Advancing communal knowledge requires collective cognitive responsibility and joint effort (Scardamalia, 2002; Aalst & Hill, 2006). Scardamalia (2002) refers to collective cognitive responsibility as “the condition in which responsibility for the success of a group effort is distributed across all the members rather than being concentrated in the leader,” and group members “take responsibility for knowing what needs to be known and for insuring that others know what needs to be known” (p. 2). This collective cognitive responsibility is essential to community refinement because modifying knowledge in a communal sense depends upon collective participation (Scardamalia and Bereiter, 2003) and requires participants to take responsibility for the process of knowledge advancement (Hewitt & Scardamalia, 1998).

Summary of Characteristics of Collaborative Group Learning

The informal structure of collaborative group learning provides the mechanism for learners to direct the path of inquiry based on their own understanding. Social interaction is the foundation on which learners develop a shared understanding. In an informal structure, such as that found in a collaborative group learning environment, social interactions progress organically and dynamically as learners work toward a shared understanding of the problem and solution. Collaboration is not a passive approach to learning but rather is a participatory process of inquiry whereby learners interact in a social context through shared activities. A fundamental criterion for participating in the collaborative process is engaging in discourse by which learners articulate their thoughts, make meaning, and develop a common language.

The establishment of a common language is a necessary component in managing group functions and processes. More importantly, however, it provides a mechanism by

which to determine shared goals. The determination of a shared goal leads to the co-creation of artifacts that are the explicit, observable representations of the group's collective knowledge. The development of a co-created artifact is in essence an external representation of the group's mutually perceived knowledge. This knowledge artifact, having been given publicly, is open to refinement by the community. Community refinement and advancement of knowledge are processes that entail active participation and responsibility from all levels of the community in constructing, refining, and, in a larger sense, contributing to what is known.

Learning Outcomes of Collaborative Learning Groups

Scardamalia and Bereiter (2003) state that the education of people should develop producers of knowledge, consequently placing learners on a continuum of developmental trajectory that starts as an inquisitive child and leads to becoming a mature knowledge producer. Collaborative group learning addresses the educational needs of a global marketplace driven by innovation and team work because of its focus on developing the greater collective intelligence not individual knowledge. In the workplace, collaboration provides the basis for creativity and for negotiating toward a consensus that has exhausted the possibilities of possible outcomes based on diverse experience and expertise (Mourtos, 1994). More simply put, "collaboration overcomes the limitations of the individual" (Stahl, 2006, p. 299).

Analyzing the effect of collaboration on cognitive development is complex because it must consider the performance of the individual and the group. Researchers of collaborative learning, Newman et al. (1997) contend that the analysis of collaboration should focus on measuring the learning process through interaction analysis, as opposed

to assessing performance as an outcome. The signs of critical thinking in a social context as evidence of group and deeper learning should therefore be measured by the generation of creative ideas, critical discussion, and collaborative artifacts. Through this approach, Newman et al. (1997) finds evidence of critical thinking where students link ideas and integrate problems back into their world and their knowledge. Similarly, in their case study of graduate student collaborative experiences, Thompson and Ku (2006) find that collaboration aids in achieving a higher level of thinking through peer interaction and sharing of ideas characterized by perspective taking and more deeply processed information.

Another aspect of collaborative group learning outcomes changes the level of thinking and inquiry as evidenced by interactions and discourse. In describing the collaborative knowledge building process, Stahl (2000) illustrates how interaction with other people refines and expands personal beliefs, resulting in a new personal understanding available for a reiteration of the overall process. This concept grounds Piaget's ideas of the adaptation process in more succinct terms. Social interactions play such a significant part in the success of collaborative group learning that its analysis has become a measure of successful collaboration. Gros (2001) recommends analyzing interactions as the means for understanding the processes of collaborative learning, thereby bringing to light principles needed for productive collaborative activity. Stahl (2006), whose own work includes extensive interaction analysis, echoes this sentiment.

In an attempt to define collaborative knowledge building interactions, Law (2005) categorizes the twelve principles of collaborative knowledge building discourse (Scardamalia, 2002) into four developmental trajectories that represent the level of

knowledge building discourse as it advances from simple to complex interactions. These categories are (1) open exploration and sharing of ideas, (2) progressive inquiry oriented interactions, (3) socio-metacognitive oriented interactions, and (4) communal interactions that are “habit of mind” (Law, 2005).

Open exploration and sharing of ideas occur in collaborative knowledge building discourse where learners extend each other’s understanding, establish a culture of acceptance, and benefit from diversity. This type of discourse eventually leads to progressive inquiry (Law, 2005). Progressive inquiry oriented interactions are an indication of learners’ discourse when they clarify disagreements, do deeper research, negotiate meaning, and set goals (Law, 2005). Socio-metacognitive oriented interactions and discourse is indicative of learning and thinking in a social context. This type of discourse happens when learners who have a personal interest in the problem synthesize new information, formulate higher levels of problems and solutions, and reflect on their progress (Law, 2005). This level of interacting eventually becomes socially aware, creating a communal “habit of mind” where learners exchange shared expertise and co-construct knowledge across groups, transferring the knowledge building methodology to other subjects or situations (Law, 2005).

In a study of intra- and inter-group interaction patterns and discourse between experienced and novice learners, Lai and Law (2006) discover that inter-group collaboration has a scaffolding effect on knowledge building for the novice group. The study results indicate: (1) there were distinct interaction patterns and discourse between the two groups, (2) the interaction patterns and discourse of the novice group changed as a result of collaboration with the more experienced group, and (3) the changed interaction

patterns of the novice group are somewhat maintained when collaboration with the expert group fades. Though the new interaction patterns and discourse eventually revert back to their original state, sufficient evidence supports the overall positive effect of peer scaffolding.

The informal structure of collaboration also has a bearing on learning outcomes through the development of community and peer support. Collaborative group learning allows community building to take place by fostering relationships and promoting the mutual commitment to goals by the members of the group (Towns et al., 2000). In their research into collaborative groups of college chemistry students, Towns et al. (2000) report that collaborative activities become a means for developing community among learners. As part of a community, the learners feel that they can rely on and trust each other and, thus, develop a sense of positive interdependence. Furthermore, relationships that develop as a result of interacting with the community are perceived as positive forces which lead students to mutually commit to achieving goals and supporting each other in learning material. These results reflect those elements that make up the environment of a community of practice, which Lave and Wenger (1991) define as a group of individuals with a common interest who participate in learning and expertise building. In particular, this type of group provides a system of support as the novice works to become an expert, or insider, through interaction with the community.

Community building impacts the nature of the shared language and discourse. For instance, Brown and Duguid (1991) point out that the “non-canonical” elements of collaboration give rise to innovative approaches to ill-defined problems. These researchers go on to say that innovation in the collaborative context is more than logical

response to scientific inquiry; it is the collaborative engagement of the group in defining a mental model of the problem and solution. This last idea of expertise building goes beyond explanations; it also means applying that understanding in diverse, practical situations where structured knowledge may fail. For example, when a repair technician fails to find the solution to a problem through the official documentation, by consulting peers the technician applies a non-standard, and possibly undocumented, approach and solves the problem (Brown & Duguid, 1991).

Challenges Facing Collaborative Group Learning

Despite the wide spread use of collaborative group learning activities in higher education, students are still reluctant to participate. Researchers have found that this is due, in part, to prior experiences (Napier & Johnson, 2007), self-efficacy (Hendry, Heinrich, Lyon, Barratt, Simpson, Hyde, Gonsalkorale, Hyde, & Mgaieth, 2005), and not understanding how groups function (Nevgi, Virtanen, & Niemi, 2006).

Simply placing students into groups does not mean they will magically learn how to effectively work together. In fact, having students work in groups without any instructional guidance may increase the likelihood that the group will become dysfunctional and consequently negatively affect students' attitudes toward future group assignments. (Chapman & Auken, 2001, p. 118)

Prior Experience and Motivation

It is not enough for the individual to be placed in a group that shares the same goal; the individual must understand his or her relationship to the group and view interacting with the group as beneficial. A study by Koivusaari (1999) where children were put into groups or worked individually reveals that prior experiences determine how

the individual approaches a situation and behaves in the group setting. This study highlighting the connection between prior experience and motivation supports Gros (2001), who maintains that learner-related parameters and instructional-related parameters need to be accounted for in the design of collaborative group learning activities.

Gros (2001) maintains that “More often [than not] students collaborate poorly and learn little more than when they work on their own” (p. 449). While Gros is concerned with instructional related parameters and pedagogical models, consideration of prior experience must take into account the broader spectrum of individual experience including culture, beliefs about knowing and learning, and motivation. Recognition of prior experience includes understanding that previous group experiences affect the learner’s predisposition to engage in collaborative activities (Napier & Johnson, 2007; Thompson & Ku, 2006).

Prior experience influences the learner’s motivation or intent to participate in a collaborative group learning activity. Groups are comprised of individuals with varying degrees of intentionality. Intentionality at the group level is purposeful engagement with the objective to participate in the group activity to achieve a shared learning goal (Bereiter & Scardamalia, 1989). When an individual shows little or no intention of participating in the group he/she is referred to as “loafing” or “lurking.” Thompson and Ku (2006) note that although their case study of graduate students in online collaborative groups has generally positive outcomes, every group reports instances of loafing where at least one individual does little to contribute to the collaborative process. Jassawalla, Malshe, and Sashittal (2008) add that loafing can be more than not contributing, but can

also be disrupting and impeding the group. In any case, the intent of the individual is not to participate collaboratively in the group learning exercise.

Group and Social Skills

In a typical group project, the instructor places learners in a group with little direction and requires them to be effective as they cope with the challenges of group work, their own motivation, and their own readiness to participate in teamwork (Volet & Mansfield, 2006). In such cases, the individual dynamics of the group are highly volatile, and benefiting from the collaborative process is dependent upon chance. Furthermore, the negative experience that will most likely come from such a situation will impact the learner's future attitude toward group learning activities (Chapman & Auken, 2001).

The complexities of collaborative learning are intertwined with group dynamics and social skills and the ongoing management of group processes. As expressed in terms of activity theory by Lewis (1997), collaborative learning provides interesting insights into group dynamics: (1) actions are not predetermined, but interpreted, negotiated and established by the shared group motive, (2) activities contain artifacts that must have a commonly understood meaning and therefore necessitate the use of social skills, (3) the establishment of protocols relates to roles within the community and expectations among participants, and (4) the assignment and ownership of specific tasks to individuals necessarily takes into account group structure and group management. To create an effective collaborative learning environment, not only must learners apply social skills but they must also navigate through the murky areas of group processes such as conflict management, task assignment, and role determination. A number of researchers

recommend preparing learners with skills for effective group learning before they enter into the group activity (Chapman & Auken, 2001; Gros, 2001; Tideswell, 2004).

Summary of Challenges Facing Collaborative Group Learning

Negative prior experiences with group learning affect the learner's future attitude toward working in groups and impact his/her willingness to be a contributor. Many variables affect how a group functions; group dynamics, group processes, and social skills must all be attended to by the learners within the group as they regulate their own and the group's learning process.

Perceptions of Collaborative Group Learning

The literature review, thus far, highlights the rationale for and the appeal of collaborative group learning in higher education. It sheds light on the research about and practical interest in group learning as a collaborative activity, pointing out the factors that contribute to the benefits and drawbacks of collaborative group learning environments. Learner and instructor perception of group learning will be the focus of the review moving forward. In particular, the review will attempt to bring forth the salient information concerning what perceptions exist and what influencing factors, if any, have been identified as affecting perceptions by learners and instructors.

Collaborative group learning interests a great many researchers in higher education. However, much of that interest regards specific attribute manipulation and analysis, rarely accounting for learner and instructor perceptions. Consequently, while a large body of research on group learning exists, in many cases the individual studies examine only the effect of a particular treatment upon the learning outcome; they do not consider learner or instructor perceptions of the collaborative group learning environment

beyond the study context, if at all. In general, the available literature concerning perceptions of collaborative group learning is sparse, but it becomes a veritable void concerning research on the instructor perspective.

This absence of research data on the instructor perspective is assumed to exist because the instructor's perspective is often equivalent to the researcher's perspective, especially when the study involves the same individual(s) filling both roles. Such an assumption postulates that the instructor perspective is often anecdotal, a by-product of the researcher's own experience. For example, examine the following excerpt:

Many instructors use group work because they feel it is useful, they want to introduce variety in their classes, other instructors employ it, or because their experience leads them to conclude that students benefit from it or simply like it, however they do not base this pedagogical tool on research-based evidence.

(Gotschall & Garcia-Bayonas, 2008, p. 22)

In this excerpt, Gotschall and Garcia-Bayonas (2008) lament that the use of group learning activities is not necessarily based on empirical research and can only surmise why instructors use collaborative group learning. Unfortunately this type of subjective justification for inclusion of collaborative group learning in instruction is not uncommon in the literature. What, then, is the basis for instructor rationale in using collaborative group learning, and what assumptions are being made about the instructor perception of collaborative group learning in the literature?

Within the literature, a multidirectional, interactive phenomenon among attitudes, satisfaction, and perceptions seems to be at work in collaborative group learning. This phenomenon is the gist of the findings of two separate studies that emphasize the

interactive nature of these elements. Napier and Johnson (2007) write that pre-existing attitudes toward group learning are related to satisfaction with group learning; whereas, Chapman and Auken (2001) find that negative attitudes about group learning relates to previous bad experience. Figure 3 illustrates this reciprocal interactive phenomenon. In this illustration there is no definitive beginning or end of the cycle between attitude and satisfaction, and the interaction effect is such that a change in one element has a cascading and compounding influence on the others. For example, the effect of a negative experience (satisfaction) in a collaborative group learning activity spawns a negative belief about its benefit (attitude) that produces a negative expectation for future situations (perception).

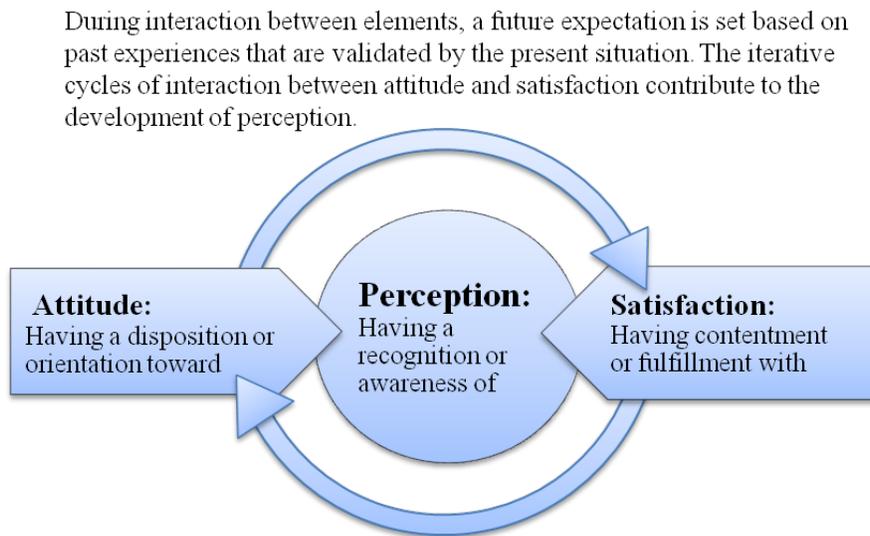


Figure 3. Interactive effect of attitudes and satisfaction on perception.

Influences to Perceptions of Collaborative Group Learning

Value and benefit. The perception of value and benefit derived from participating in collaborative group learning is based on pedagogical and professional factors related to the relevancy of the activity in meeting the individual’s academic and/or career goals

(Scribner et al., 2003; Volet & Mansfield, 2006; Woolf & Quinn, 2009). Perceived value of the collaborative group learning environment comes from the learner's own beliefs that as an instructional method the activity will benefit him or her in the development of skills that will ultimately be of value in their professional careers (Scribner et al., 2003). This anticipated future benefit to the learner's career is a primary reason for utilizing collaborative group learning from the instructor's perspective. Ahern's (2007) study of university-level civil engineering instructors finds that collaborative group projects were implemented as learning activities by all respondents to the survey as a means for developing the "soft skills" needed in professional life.

However, the use of collaborative group learning must be coupled with some degree of authenticity to motivate learners to engage in the activity. Goal alignment and relevancy are a primary concerns from both the learner's and instructor's perspective. In their study of university business majors, Volet and Mansfield (2006) find that the perceived value of group work links to the professional relevance of the activity and learners with negative perceptions feel that group work holds little benefit or relevance to their future professional careers. In contrast, learners with positive perceptions believe that group work is an integral part of the academic experience because it directly impacts their development of skills needed for their future professions.

In their study of learners' perceptions of value associated with participating in an activity modeled after professional instructional design practice, (Woolf & Quinn, 2009) report that perceived value relates to the relevancy of the group activity. The type of activity, its level of appeal, the type of interaction with other learners, and the task itself affect its perceived relevancy and subsequent value as a learning method. This research

further finds that learner perceptions of value regarding group work are most impacted by the features of the activity grounded in task authenticity, control and accountability.

Pedagogical goals, professional goals, and relevancy sometimes confound the learner's perception of value and benefit. As the literature shows, contradictions exist concerning learner perceptions of collaborative group learning. For example, Tideswell's (2004) qualitative study of 35 university entrepreneur students finds "a general acknowledgement by students that group work has its merits in a social development sense, but also that it is generally regarded as a frustrating situation imposed on students by lecturers" (p. 12). Such learner perceptions are very similar to what Ahern (2007) finds in the instructor perception that recognizes the benefit of collaborative activities on developing certain skills but does not value collaborative group learning as an instructional method. One instructor comments about using group activities:

Therefore, while group work is worthwhile and necessary for students to learn about work in the real world, I am reluctant to make students engage in an activity for which there are no academic rewards and the students are also reluctant to engage in those activities. (Ahern, 2007, p. 524)

Similarly, Phipps et al. (2001) report that learners have a positive attitude toward group work but do not value it as an effective way to learn or see it as a motivator to study harder. Thus perceptions are not based solely on prior experience; they are also influenced by individual traits and work preferences (Scribner et al., 2003).

Willingness to participate. In terms of pedagogical goals, intentionality occurs when the learner purposefully engages in a collaborative group learning activity with the intrinsic goal of activating cognitive processes (Bereiter & Scardamalia, 1989).

Alignment of the collaborative group's goals with the individual's personal goals further develops intentionality toward the activity. Such intentionality represents the learner's premeditated intent to engage in group learning because it will help him/her achieve his/her learning goals. Scardamalia and Bereiter (1994) assert that intentionality is crucial because as individuals decide upon group membership and interaction, they are strongly biased according to the alignment of their individual goals with the goals of the group. The intentionality of the learner is, therefore, his or her willingness to participate in and commit to the collaborative group learning activity as a means of achieving his or her goals.

However, a willingness to participate in collaborative group learning activities is not simply a matter of perceived value and benefit; it also depends on the individual's own learning preference, confidence in success, and expected level of effort that is required to obtain his or her learning goals (Chapman & Auken, 2001). The research of Phipps et al. (2001) of 210 university students from multiple disciplines supports such claims, reporting that learners were not prepared to work together, resented depending upon others for grades, and were motivated by different goals. In relation to negative perceptions of collaborative group learning, this response may well represent the learner's reaction to a changed learning paradigm where the requirements of success are drastically different from what he or she is comfortable with (King & Behnke, 2005; Phipps et al., 2001). Phipps et al. (2001) contend that learner perceptions regarding group work may be negative because it is an unfamiliar or less desirable approach to learning that involves more skills and time. Instructors not providing enough support and guidance exacerbate that perception.

Learning preference alone is not a direct indicator of learner perception, as a survey of learner attitudes toward working in groups conducted by Gotschall and Garcia-Bayonas (2008) points out. In this study of undergraduate students from mathematics, business administration, and education, the majority of participants in the mathematics group prefer to study alone. However, when asked about their attitudes toward group work, the majority of those in the mathematics group do not report a negative attitude. This dichotomy may be based upon the learner's preference for control over the situation or confidence of success with the instructional approach itself. The term "group-hate" is sometimes used to describe learner's negative attitudes toward group work. Loss of individual control and increased time spent on ancillary group activities required to keep the group functioning may be the cause of such perceptions (King & Behnke, 2005).

The level of effort needed for effective collaborative group learning is a major concern for both the learner and instructor perceptions of group work. To work effectively as a group requires a commitment; it takes time to build relationships, work through group processes, and become productive as a group. Gotschall and Garcia-Bayonas (2008) report that the most commented upon negative attitudes toward working in groups are regarding issues of time. Coordinating schedules had the highest negative attitudes among all categories. Learners see themselves as juggling an already busy workload with an added need for meeting with their group (Scribner et al., 2003). Instructors, too, have concerns about the time commitment needed for collaborative group learning activities. Two-thirds of the instructors in Ahern's (2007) study report that the requirements of collaborative group learning activities take up too much of their time. One instructor comments, "The main difficulty with group work is devoting sufficient

time to it within the module to make sure that it does achieve the required learning objectives” (p. 523). Another states that “[my] schedule was already ‘too overcrowded’ with research, administration and teaching for me to implement group work more effectively” (p. 523).

The instructor’s role. Learners often comment on the instructor’s role and actions as factors affecting their group learning experience and perceptions (Hansen, 2006; King & Behnke, 2005; Volet & Mansfield, 2006). Volet and Mansfield (2006), in their qualitative study of university business management students, report that the most commented upon facet of collaborative group learning is the instructor’s role. Learners in the study report that they want more instructor involvement in general. This view of the instructor role agrees with other researchers who find that instructor involvement has a positive impact:

In fact, a primary reason that students may have some negative feelings about working in a group may be due to a bad experience with a previous group Students with more positive attitudes toward group work were in much stronger agreement with the benefits of group work, less concerned about work and grade inequities, and felt their instructors were playing a more active and positive role. (Chapman and Auken, 2001, p. 122)

Overall, however, the literature reveals that instructors do not take a proactive role in assessing how the groups are functioning or discuss with learners about the dynamics and management of groups. Hansen (2006) bemoans that many faculty who employ group learning "do nothing more than that, either because of time constraints or not being overly familiar (or comfortable) with the team work and team-building literature" (p. 15).

Findings in Ahern's (2007) study reinforce this complaint by reporting that most instructors "left this to the students themselves to ensure that teamwork skills were achieved" (p. 522) and that "it was assumed that a group that achieved a high mark in the assessed work would have mastered these skills" (p. 523). Findings like these are unfortunate, especially since proactive activities by the instructor have important implications for success, and subsequent perceptions, of collaborative group learning. In their study of marketing students, Chapman and Auken (2001) have discovered a positive correlation between instructor discussion of group work strategies and learner attitudes towards group work:

Not only did the instructor's role construct have a significant direct and positive influence on attitudes toward working in a group but it also had a strong and positive influence on perceived benefits and a negative influence on work and grade equity concerns. These findings indicate that as the instructor becomes a more positive, proactive agent on behalf of group work, students' beliefs in the benefits of group work and their overall attitudes toward it improve. Moreover, the negative influence the instructor has on grade and equity concerns indicates that as the instructor's role becomes more positive, student's work and grade equity concerns decrease. Reducing students' concerns about work and grade inequities is an important issue since this variable not only directly influences students' attitudes toward group work but also has a negative influence on perceived benefits. (Chapman & Auken, 2001, p. 121)

In the above excerpt from their research findings, Chapman and Auken (2001) point out that the instructor role both directly and positively influenced learner attitudes toward

working in groups and helped minimize anxiety toward work and grade inequality. The overall result is that as the instructor takes a more proactive role in collaborative group learning then learner attitudes become more positive and perceived benefit increases.

The most common negative perception held by learners and instructors about collaborative group work associates with views on group assessment and evaluation inequalities (Ahern, 2007; Hansen, 2006; King & Behnke, 2005; Pfaff & Huddleston, 2003; Volet & Mansfield, 2006). Social loafing directly impacts learner perceptions about group work, but loafing is an area where understanding is still evolving, especially as it concerns the learner's perception of the instructor's role. In their research of student perceptions of social loafing in undergraduate teams that included 394 business students, Jassawalla et al. (2008) find that student perceptions of loafing are far more complex than previous literature indicates. Instead of applying only to group members who slack off, the student view of social loafing also includes hindering behavior and unsatisfactory work. Furthermore, the study shows that the learners themselves tended to avoid confronting the issue, preferring that it be handled by the instructor. Thus, when an instructor is not aware of group issues or does not provide mechanisms for evaluating peer performance, feelings of unequal reward result, thereby contributing to negative experiences and attitudes on the part of the learner (Chapman & Auken, 2001).

Instructor perceptions of social loafing and grade inequality are in harmony with those of the learner. Ahern (2007) finds that instructors have the most reservations about implementing collaborative group learning because of a lack of individual accountability and fairness in assessment. One instructor sums up the general perception:

The fundamental problem remains. Students are graded as individuals and group work blurs the contribution of individuals. It is unfair to the best students.

Therefore, while group work is worthwhile and necessary for students to learn about work in the real world, I am reluctant to make students engage in an activity for which there are no academic rewards and the students are also reluctant to engage in those activities. (Ahern, 2007, p. 524)

Summary of influences to perceptions of collaborative group learning.

Understanding the factors that affect learner perceptions has important implications because the learner's perception of the value of collaborative group learning will determine to what extent he/she participates in and commits to the group activity and thereby accesses the benefits of collaboration. However, even before the collaborative group learning begins, the learner may create an expectation of failure or dissatisfaction with the instructional approach that results in negative behavior. Finding this to be true in their research, Thompson and Ku (2006) report that "a few participants had a very negative attitude toward group work to start with, were not open to suggestions, and purposefully built up a barrier between group members and themselves" (p. 368). Figure 4 outlines the factors that influence the perception of collaborative group learning. The factors affecting perception and the extent to which the design and implementation of sound instructional practices influence such factors hold great importance.

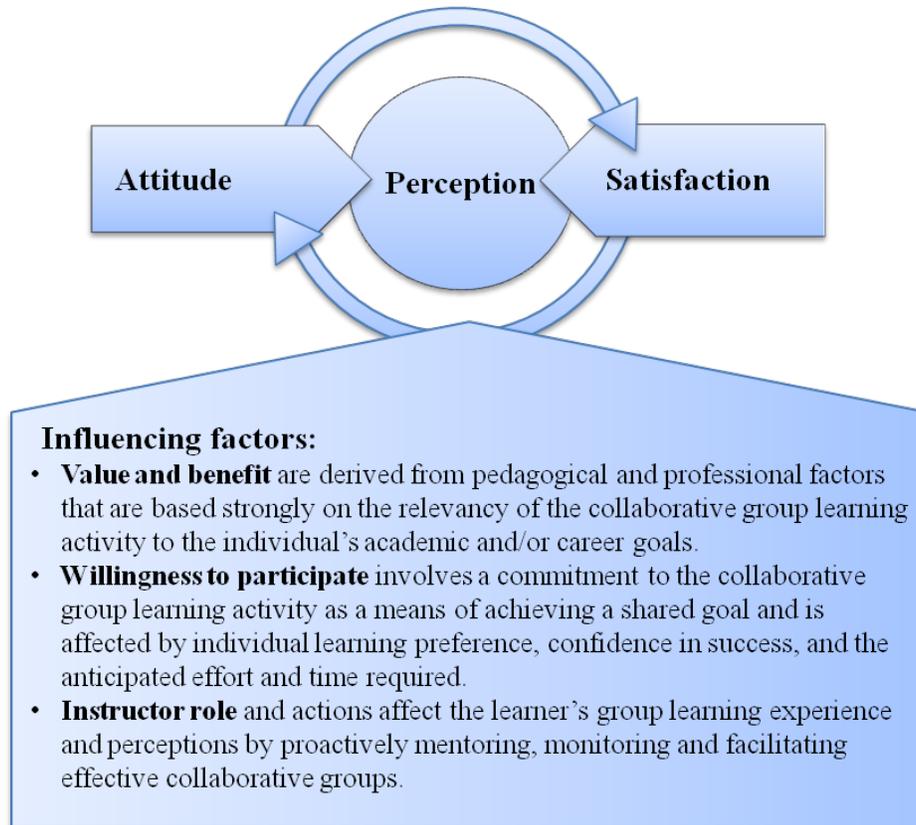


Figure 4. Influencing factors on perceptions of collaborative group learning.

Role of Instructional Design and Technology (IDT)

Developmental and design concerns. Social and group skills are necessary to group learning. In discussing the role of instructional design on collaborative activities, Gros (2001) points out that the positive findings reported for collaborative group learning are encouraging, but there is a need to educate learners on how to work together. The argument is that learners do not necessarily possess the self-efficacy and skills needed to be successful in groups, and for this reason the desired social behaviors must be explicitly identified and taught because they are not inherent (Johnson, Johnson, & Holubec, 1994). In agreement on how to improve group effectiveness, and thereby perceptions, Tideswell (2004) declares that the “keys to success” in a collaborative group learning environment must be taught along with the content related to the topic. This is because learners have

limited “real-life” experiences and “cannot be expected to simply ‘know’ what is involved in techniques such as ‘brainstorming,’ idea generation and reaching group consensus” (Tideswell, 2004, p. 21).

Time is a concern, both as a requirement for the instructor and as a requirement for learners, because it has a direct effect upon how collaborative the group becomes, and the level of collaboration will be reflected in the satisfaction and value placed on the group learning experience (Napier & Johnson, 2007). In their study of factors that affected learner attitudes toward teamwork, Pfaff and Huddleston (2003) find that the factors relating to time held the most significance in predicting positive learner attitudes toward collaborative group learning, especially in relationship to expected workload and scheduling time to meet as group.

The instructor’s predicted time for a group to reach a point of functioning effectively is often unrealistic (Hansen, 2006). In addition, the instructors perceive that although necessary for developing professional skills, collaborative group learning does not add value as an instructional approach and consumes altogether too much time (Ahern, 2007). Tideswell (2004) proposes that, to reduce the amount of time the group spends working out group issues, the instructor take time at the onset of the collaborative group learning activity to introduce learners to effective group processes and decision making. Pfaff and Huddleston (2003) also recommend ensuring that the activity is appropriate to the desired outcome and making some class time available for working in groups.

The appropriateness of the activity reward to the required level of effort has a bearing on the learner’s perspective (Pfaff & Huddleston, 2003). It is also a direct

reflection of the instructor's perspective of value and benefit that will not escape the learner's notice. For example, consider the effect on the learner's perspective of a collaborative group learning activity that requires a great deal of effort but only influences a small portion of the overall grade due to the instructor's perspective of and self-efficacy with the instructional approach (Ahern, 2007). Learner perceptions that collaborative group learning is good for building certain skills but is usually no more than a frustrating situation probably reflects such an experience (Tideswell, 2004). Learner views of group work become negative, especially if there is a perception that the activity is no more than a way for the instructor to "assign resources more efficiently and would have less [grading] to do than if projects were assigned individually" (Ahern, 2007, p. 522).

The perception of value a learner holds about group work cannot be predicted or assumed, but it can be influenced. Researchers recommend that instructors monitor learner perceptions of value in multiple ways to gain input at the observable, individual, and group levels (Woolf & Quinn, 2009). King and Behnke (2005) advocate engaging learners in discussions about the challenges of evaluating group work to build more positive attitudes. Based on their own research, Chapman and Auken (2001) suggest instructors take the following actions to improve student perceptions of group work: (1) discuss the benefits of working in groups, (2) minimize work and grade inequities, (3) allow students to discuss openly prior experiences with group work, and (4) provide guidance about how to approach group work as a process.

It is critical, prior to undertaking a group project, that group members express their concerns and past experiences with group work.

When small group learning is structured so that positive interdependence is not perceived, individual responsibility is not required and perceived in order to reach the group's goal, effective interpersonal skills are not taught and used, and group processing is absent, then group work is ineffective. When there is a balance between positive interdependence among group members and individual responsibility, coupled to mutual commitment, mutual goals, the use of effective interpersonal skills, and group processing, then group work can promote achievement. (Towns et al., 2000, p. 116)

Drawing attention to the issues of prior experiences by allowing learners to voice concerns provides an opportunity to mentor, prepare and set expectations for effective collaborative group learning, and identify possible obstacles beforehand.

Research concerns. In their study, Woolf and Quinn (2009) find that the role and approach of the instructor impact learner perceptions of value and recommend further research into the extent of this influence. Other research has shown that positive attitudes of team members improve a group's effectiveness and that researchers need to understand the instructor's influence on creating positive learning environments (Chapman & Auken, 2001). Perceptions are not directly manipulated; perceptions develop through iterative interaction of attitude and satisfaction. It is through the manipulation of factors that affect attitude and satisfaction that instruction can influence perceptions, as shown in Figure 5.

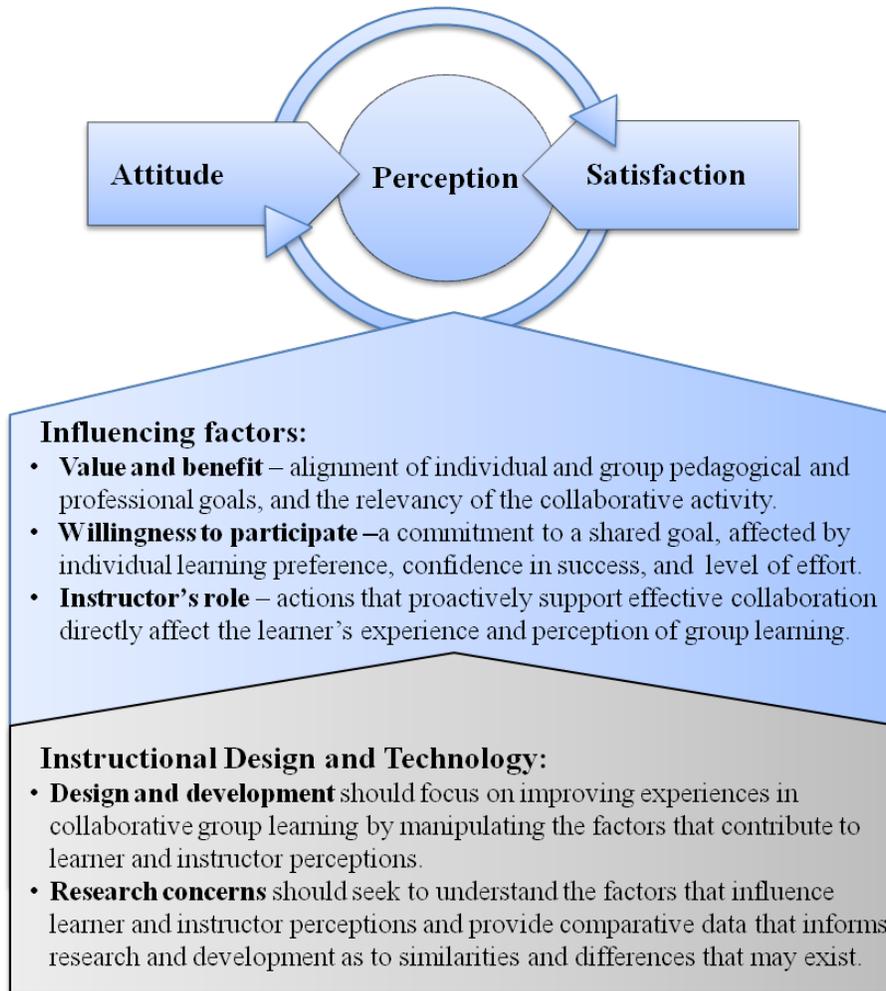


Figure 5. Role of IDT in influencing the contributing factors of perception.

Instructors need to understand better those factors that influence the success of groups and be intentional about their implementation (Chapman et al., 2006). The implication of such research is:

By knowing what factors impact team satisfaction levels, instructors can begin to implement effective strategies for combating any negative effects of team projects. Instructors can adopt various techniques for ensuring that student teams are successful so that students will have a more positive teamwork experience

where conflict is appropriately managed and students feel that they have learned something of value. (Napier and Johnson, 2007, p. 45)

A major characteristic of research design of collaborative group learning concerns its multidimensional aspects, spanning various pedagogical and practical drivers as well as diverse individual learner motivations and learning preferences. Research into perceptions of collaborative group learning must clarify on what level the learner is being asked to qualify or quantify his or her perception. Is the learner's perception based on his or her belief in the future value of collaborative group learning to his or her professional development (Scribner et al., 2003), on the present pedagogical value (Phipps et al., 2001), or on the relevancy of the activity itself (Woolf and Quinn, 2009)?

There are many avenues for research of collaborative group learning to take. The influence of the instructor's role on student's attitudes toward group work has not been researched adequately (Chapman & Auken, 2001). Thompson and Ku (2006) suggest that future studies should involve getting richer information about learner experiences. Hansen (2006) calls for a larger sample across multiple institutions to further the research on the perception of the value of group work held by the learner and instructor.

The lack of literature regarding instructor perspectives makes it even more compelling as a research topic. Research into the instructor's perspective can provide comparative insight into all aspects of collaborative group learning, including the instructor's own role. For instance, the instructor perception can help contrast and analyze learner perceptions such as those made by participants in the study conducted by Gotschall and Garcia-Bayonas (2008). In this study, learners comment that "instructors did not give enough directions and that instructors used group activities as a way to do

less work” (p. 17). These learners’ comments may very well be based upon a pedagogical strategy where the literature recommends that instructors “stand back and let them work it out” (Vik, 2001, p. 114). This strategy intends to give the learner the responsibility for solving process and problem issues, but the learner may not understand this intention or may not want to accept this responsibility. Issues like this bring to light the lack of comparative data available from learner and instructor perspectives. Chapman et al. (2006) assert, "A productive avenue for future research would be to systematically compare student and instructor perceptions regarding group projects to assess if large differences exist" (p. 567).

Summary of role of IDT. The role that IDT plays in the study of group learning environments promises to be of value to both its theoretical and practical advancement. As a field, IDT is not interested in research into group learning as merely an academic pursuit, but it also finds value in implementing recommendations arising from that research. Studies of learner perceptions of group learning reveal several developmental concerns for those designing and implementing collaborative group learning. The social and group skills needed in collaborative group learning are not inherent; therefore, the instructor should provide guidelines for working in groups effectively. This strategy may involve discussing collaborative group learning expectations, prior experiences, and attitudes with the learners prior to the group learning activity.

Time requirements must also be considered, allowing enough time for groups to become productive and giving consideration to learners’ busy schedules by providing some class time for group work. In addition, the instructor needs to be aware of how well a group is managing itself and be ready to facilitate group processes that have stalled.

Research concerns for IDT about group learning need to address both instructor and student perceptions. There is no clear understanding within the current literature as to what similarities and differences exist between these two constituencies. Furthermore, there is a void in the literature about how instructors perceive their own role and to what degree they hold students accountable for effective learning in the group context. It is clear, however, that research needs to be done on how the instructor role affects learner perceptions and group effectiveness.

Summary of Perceptions of Collaborative Group Learning

In general, the literature in the area of learner and instructor perceptions of collaborative group learning is far less abundant than what is available for other areas of group learning research. In particular there is a deficiency concerning the instructor perspective. The perception of group learning is important because it is the first indication of a learner's motivation to engage in group learning, and it relates to the expected benefit that participating in the group will provide. The perceived value of group learning, therefore, motivates the learner to interact with the group and assist in attaining the shared goal. The perceived value represents a belief that the collaborative activity holds some pedagogical or professional benefit for the learner. The willingness of the learner to participate in the group learning activity is a product of the alignment of the individual and group goals. However, willingness to participate is also influenced by the learner's own learning preference and the expected commitment to the group. The instructor's role is likewise important in shaping perceptions of group work. A common comment from learners regards the instructor's role and involvement in the process

indicating that instructors positively influence perceptions about group learning by actively monitoring group work and being more open about its benefits.

The role of IDT in the design and development of group learning environments and activities needs to address the learner's preparedness to function in groups. Necessary skills must be taught to learners because it cannot be assumed that they possess them already. As they implement group learning activities, instructors need to consider the time learners need to organize and function productively as a group. The instructor needs to plan for the formative stages of groups in their instruction and learners must accommodate the time commitment required. IDT plays a significant role in research because of its pragmatic interest in group learning theory, research, and practice. Learner perceptions of collaborative group learning cannot be directly influenced. Instead, the factors affecting collaborative group learning must be researched as a basis for design and development. For this reason, IDT should engage in research that contributes to better understanding the factors influencing perception and the comparative perceptions of group learning held by learners and instructors.

Overall Summary of Literature Review

The appeal and interest of group learning in higher education can be attributed its theoretical underpinnings and practical applications (see p. 9). Groups are not a new phenomenon, but the study of groups is relatively new. The pervasiveness of groups in all facets of life has spawned widespread interest, and as a result, group research has been influenced by many disciplines and research orientations (see p. 10). Educational interest in group learning became popular during the 1960s as a result of the emergence of constructivism and the emphasis on learning in a social context (see p. 11). The 1970s

began a wave of interest in small group learning research that continued into the 1990s when technology brought an onslaught of interest in how networked computers could be used to support group learning. The appeal of group learning in the educational context also relates to such practical aspects as being useful for developing professional skills and its adaptability to any number of learning contexts (see p. 12).

Social interdependence theory, the constructivist perspectives of Piaget's cognitive developmental theory, and Vygotsky's social-cultural theory heavily influence the theoretical basis for interest in group learning (see p. 13). Social interdependence theory maintains that the structure of a common goal drives interaction among group members, and the nature of these interactions determines the achievement of the goal (see p. 14). In that sense, social interdependence can be both positive and negative (see p. 15). The strength of this theory is its origination from a systems-oriented approach, which focuses on the interactions and motivations at work in the group processes. Johnson and Johnson have advanced social interdependence theory in the educational context by describing the effect of positive interdependence on group interactions that encourage individuals to work cooperatively to attain a shared learning goal (see p. 15).

The constructivist theories address the social component of group learning by providing insight into the effect of social interactions on cognitive development. Constructivism embraces the notion that the learner constructs his or her own knowledge out of his or her own experience (see p. 17). Piaget's cognitive developmental theory influences constructivist views regarding how learning occurs and the process of adaptation in the social context as explained by the concept of equilibration (see p. 18). Equilibration proposes that individuals seek to sustain balance in their cognitive

processes. Learners accomplish equilibration by developing organizing schemes that are in constant flux as new experiential stimuli either assimilates the experience into an existing scheme or force a scheme to accommodate the new data (see p. 18). Social interaction plays a significant role in this process because it is both a source for disequilibrium and equilibrium as learners incorporate their own experiences with those of others with whom they interact. This mutual adaptation process is the basis of group learning and the social construction of knowledge (see p. 20).

Vygotsky's socio-cultural theory emphasizes social interactions with more knowledgeable others as the most productive way to learn (see p. 21). This approach to learning, namely the zone of proximal development (ZPD), focuses on the scaffolding effect of learning when a peer, mentor, or teacher aids a learner in achieving a learning goal beyond his or her capabilities (see p. 22). This progressive view of cognitive development focuses learning on the potential of what can be accomplished rather than on what should be accomplished (see p. 22). In the collaborative group learning environment, where group members have diverse skills and experience, ZPD promotes reciprocal scaffolding as members extend one another's knowledge (see p. 23).

The cognitive theories of situated cognition and distributed cognition also support group learning by explaining the impact of authenticity in task, context, and activity (see p. 23). Situated cognition focuses on the role of relevance in social interactions and the learning environment. In particular, there is an interest in how learning is supported through participating in a community as it engages in authentic activity that fosters inquiry and analysis (see p. 24). Distributed cognition takes an even broader approach to context by proposing that the embodiment of meaning is not only found in the

interactions among individuals but also in the objects and activities of the social setting (see p. 24).

There is also a practical interest in group learning that is strongly tied to the demands of a workplace, where the ability to work in groups is essential (see p. 27). Employers seek employees who have the skills required to be effective members of a team. Some argue that student preparation for profession life should be a central concern for higher education (see p. 28). Furthermore, such preparation should include team projects that develop competencies such as communication, group processes, and interpersonal skills in “real-world” settings (see p. 29).

In essence, the theoretical and practical purposes for using groups in learning are complementary. The theoretical drivers supporting skill transference and cognitive development align with the experience gained in practical application of skills needed in a contemporary team-oriented working environment. For both theoretical and practical reasons, instruction should be designed to take advantage of authentic experiences and activities. A framework for learning that includes participation and interaction prepares the individual to become a life-long learner engaged in communities of inquiry at the academic and professional levels.

Research regarding group learning finds that it has both cognitive and socio-cognitive benefits. Meta-analyses of the disparate research studies on group learning compiled by several researchers span decades, disciplines, and settings (see p. 30). The analysis of research reveals that when groups work cooperatively, there is consistent evidence of significantly higher achievement in problem solving activities requiring complex tasks. Research into group learning also finds that working in groups affects

learner's development of social skills, motivation, and attitudes (see p. 31). Though the research is largely positive regarding group learning, the diversity in research methods and measures has generated uncertainty about their predictability and repeatability and, hence, has meant reluctance to accept the studies widely (see p. 32).

While there has been a great deal of research into group learning, few models explain the phenomenon of learning in the group environment. Researchers of cooperative learning David Johnson and Roger Johnson based such a model upon the premise of social interdependence theory that contends that positive interdependence promotes positive interactions (see p. 33). These positive interactions will then have a positive influence upon the learner's effort to achieve, relationships within the group, and general psychological well-being.

Group learning is very flexible and adaptable. As an instructional approach it can take many forms and this lack of standardization has been one of the challenges for those involved in its research. Nonetheless, this document identifies some broad categories of group learning in an effort to better understand the characteristics of the most common types of group learning (see p. 34). Pseudo learning groups, traditional learning groups, cooperative learning groups, and collaborative learning groups vary in their level of interdependence, structure, reward and individual accountability. Pseudo learning groups and traditional learning groups have negative or no interdependence and low individual accountability (see p. 35). Collaborative learning groups, like cooperative learning groups, encourage positive interdependence and high individual accountability. However, the informal structure and informal interactions of collaborative learning groups is intended to foster learner-led discourse and inquiry (see p. 36).

Collaborative learning is commonly used in higher education. The surge of interest in collaborative learning groups in higher education is due to its informal nature, adaptability of implementation approaches, and, just as importantly, to the greater range of possible engagement activities provided by technological advances (see p. 38). Goal interdependence, informal structure, and shared artifact creation are defining principles that set collaborative group learning apart from other types of group learning (see p. 39). As a systematic process, collaborative group learning has no defined model. However, certain process characteristics can be ascribed to collaborative group learning (see p. 40): (1) informal structure, (2) participatory process of inquiry, (3) discourse and meaning making, (4) co-creation of artifacts, and (5) community refinement.

The types of interaction that occur in the informal setting of collaboration differentiate it from other types of group learning (see p. 42). The informal structure allows learners to interact dynamically as they develop as a group. Such interaction is important because it enables the group to direct its own learning as learners develop a shared understanding of the problem (see p. 43). However, the informal structure also means that the group must develop its own group processes. Interaction among the group members establishes the relationships that determine the level of trust and commitment within the group, which translates into their level of participation. Collaboration is driven by participation. Collaborative learning groups represent a shift in the nature of inquiry from passive acquisition of knowledge to an active and participatory process of constructing knowledge (see p. 44). This process of inquiry derives from the learner's participation in a social environment and shared activities. Participation allows learners to

take part in guiding the direction of the inquiry and take responsibility for their own learning (see p. 46).

Discourse and meaning making are vital to collaboration (see p. 47). Through discourse, individuals externalize their perspectives and take in others' perspectives. The process of making meaning allows differing perspectives to find a common ground and thereby develop a shared goal (see p. 48). Discourse helps to establish a common understanding of both the problem and its solution. Without this common ground, the collaborative learning group cannot move forward to achieve its goal. Discourse and meaning making are central to effective collaboration because it is within these interactions that learning occurs (see p. 49).

Once established, the negotiated perspectives that have led to a shared goal are manifest as a co-created artifact (see p. 50). This co-created artifact is not simply a completed task; instead it represents a knowledge object that is the result of a consensus of perspectives within the group. Neither is this co-created artifact an absolute truth, but rather it is an advancement of knowledge that is made public and thereby open for community refinement (see p. 51). The culminating characteristic of collaboration is that it is a shift away from the individual cognitive process toward a communal advancement of knowledge. It necessitates involvement in a community and the continual refinement of what is known through iterative cycles of retesting, redefining, and hypothesizing (see p. 52).

Learning outcomes of collaborative group learning include increased levels of critical and creative thinking, changes in discourse characterized by more complex interaction patterns, and changes in the individual's process of inquiry (see p. 54). The

complex social learning environment of collaborative group learning necessitates that measuring its effectiveness focuses on the learning process not on individual performance. The interactions that occur in the collaborative environment are evidence of cognitive development because they are replete with meaning and signs of higher order thinking (see p. 55). Another outcome of collaborative group learning is that it fosters the building of community where peers support each other in the learning process and build relationships that lead to a mutual commitment to the shared goal (p. 57).

Collaborative group learning has much to offer as an educational method, yet the dynamics of a group and the nuances of diverse individuals requires attending to many subtleties for the group to be effective (see p. 58). Chief among the individual attributes that need attending to is the motivation that compels a learner to engage in the group learning activity as a result of a belief that participation will be beneficial in achieving some desired goal. This motivation is an intentionality based on an internal compulsion to join together with others who are perceived to have a shared motivation and goals (see p. 59). However, even if there is a willingness to participate, to have an effective group learning experience the group must overcome the challenges of group dynamics, facilitation of group functions, and dealing with learner traits such as prior experience (see p. 60). The success of the group in achieving its goal in turn affects the learner's satisfaction with the learning experience and ultimately with their general perception of collaborative group learning.

A great deal of literature is available on the subject of group learning, but little of it focuses on learner perceptions of collaborative group learning. Even less literature addresses the instructor's perception in this regard. Research available from the learner's

perspective usually examines the effect of a manipulated variable on the perception of a specific characteristic of group learning. Furthermore, contradictions within the literature about the nature of learner perceptions of collaborative group learning complicate the understanding of the cause and effect of perceptions (see p. 61). In particular, the research into learner's perceptions does not account for the learner's perception of the value of the pedagogical method as it relates to their intent to participate, nor does it measure the extent to which that perception may affect the observed results (see p. 62).

Perceptions cannot be directly manipulated. They instead interact with attitudes toward the alignment of the present situation with the learner's own pedagogical and professional goals and with the learner's satisfaction with how well those goals have been met in prior situations of the same nature (see p. 63). The past benefit experienced from collaborative group learning influences the learner's perception and the anticipated value of such activities in the future. The current collaborative group learning experience further validates those perceptions. In this sense, the learner's attitudes and perceptions can promote or inhibit his or her actions even before the collaborative group learning activity begins (see p. 63).

Because they represent the expectation that the collaborative group activity will contribute to the achievement of the learner's pedagogical or professional goal, value and benefit are driving forces in the development of perception (see p. 64). Pedagogically, learners feel a compelling need to participate in collaborative group learning when they believe that such an activity has value in helping them attain their learning goal. Relevancy brings authenticity to activities and further aligns them with the learner's goals and, thus, will affect his or her perception of value and benefit (see p. 65). Instructors

mostly perceive collaborative group learning as a way to develop skills that cannot be developed through other instructional methods. They do not regard collaboration as a valuable method of instruction in and of itself (see p. 65).

Willingness to participate in collaborative group learning activities is intentional, and is strongly based on how such participation will help the learner achieve his or her goals (see p. 66). Hence, intentionality to participate and commitment to success determine the level of interaction a learner has with the group. A number of factors beyond the value context of the collaborative group learning environment influence a learner's willingness to participate: learning preferences, confidence in success at obtaining the goal, and expected level of effort (see p. 67). While learning preference influences willingness to participate, this factor does not necessarily evoke negative perceptions of collaborative group learning (see p. 67). However, learner preference derives from his or her perceived loss of control within the group and his or her perceived level of confidence in obtaining the goal through involvement in the collaborative group learning context (see p. 67). Additionally, the required level of effort also influences willingness to participate and time considerations greatly affect both learner and instructor perceptions (see p. 68).

An aspect of collaborative group learning that learners most often comment upon is teaching practice. Learners perceive that proactive instructors have a positive impact on their success and satisfaction with collaborative group learning (see p. 68). However, instructors typically do not take an active role in facilitating or monitoring collaborative group learning activities (see p. 69). Social loafing and grade inequality affect both learner and instructor perceptions (see p. 70). Learners perceive social loafing not simply

as not participating but as disruptive behavior that instructors should monitor and prevent even when no one complains (see p. 70). Although social loafing and grade inequality likewise concern instructors, they are not apt to take proactive measures. Instructors perceive collaborative group learning as already time consuming, lacking individual accountability, and difficult to assess fairly (see p. 71).

As a field of study, IDT has a unique role because of its interest in group learning from the pedagogical, practical, and research perspectives. In all of these areas, IDT has some stake in understanding the complexities of group learning, seeking to prepare learners to enter the field of IDT better equipped to work in groups, to design and develop group learning that is well informed, and to research theoretical drivers and recommend their use and implementation to the wider arena of academia. The developmental concerns for IDT should focus on improving student experiences in the collaborative group learning environment by influencing the factors that contribute to learner and instructor perceptions (see p. 73). The design of instructional activities and development of instructional methods should seek to influence the perception of the pedagogical value and benefit of the collaborative group activity, a major factor in both the learner's and instructor's level of participation and commitment to success (see p. 75). The research into perspectives of collaborative group learning should seek to understand the contributing factors and their influence on learner and instructor perceptions (see p. 76). The role of the instructor needs to be researched from the distinct views of the learner and the instructor (see p. 77). Chiefly, however, it is highly critical that the instructor's perspective of collaborative group learning be examined to provide

comparative data to inform research and development about similarities and differences between learner and instructor perspectives (see p. 78).

Purpose of Study

There are many reasons for learners to work in collaborative groups in higher education. These reasons range from preparing learners for workplace demands to the cognitive and socio-cognitive benefits attributed to learning collaboratively. The development of critical thinking and teamwork skills are examples of the outcomes of collaborative group work that are fueled by group dynamics such as diversity, roles, trust and controversy. However, the challenges derived from these same group dynamics must be overcome before the group can function effectively. In addition to group processes and social skills, there may also be other factors that need to be dealt with such as the learners' prior experiences and personal motivation. All of this has the possibility of being intensified if the context of the collaborative group work is self-directed and there is a lack of supervision and intervention. The problem facing the informal collaborative process in higher education is that of the effective facilitation of group processes within the collaborative group itself and the perceived need for mediation expected at the learner and instructor level. Thus, there is a need to understand from the instructor and learner perspectives the value and benefit of group work and the expectations of making groups successful that each assigns to the other.

The purpose of this study is to discover how college-level learners and instructors perceive collaborative group work within a learning context, including: (a) the value that each constituency places upon collaborative group activities, (b) the factors each constituency believes contribute to successful collaboration, and (c) the expectations of

accountability to successful collaboration that each constituency assigns to the other. Findings will provide insights into the practical implications for designing and facilitating collaborative learning groups by informing instructors and instructional designers of perceptual similarities and differences between students and instructors.

Research Questions

The overriding question concerns how college-level learners and instructors perceive collaborative group work in a learning context. This includes the following sub-questions:

- What perceived value do college-level learners and instructors hold of collaborative learning groups?
- What factors do college-level learners and instructors believe contribute to successful collaborative learning groups?
- What expectations of accountability to successful collaborative learning groups do college-level learners and instructors assign to each other?

Significance of Study

By drawing from various collaborative group learning environments in higher education this study seeks to contribute to the existing literature base concerning learner and instructor perceptions of collaborative group learning. By allowing these two constituents to express their beliefs and prior experiences regarding group learning values, factors of success and the expectations of accountability a baseline of similarities and differences can be developed. As a result, the findings of this study will provide a comprehensive benchmark that is important to (1) researchers because it will synthesize

the existing disparate research into a more unified view and provide much needed instructor perceptions, (2) instructional designers because it will provide a basis for understanding the perceptions of learners and instructors and provide guidance for implementing effective group learning environments, and (3) instructors because it will identify the perceptions of the instructor role and its impact upon collaborative group learning that can be used to inform strategies for implementation.

Chapter 3: Methodology

This chapter details the research methods and design developed to address the research questions for this study and describes the population, sample, sampling procedures, instrumentation, pilot test, data collection process, and data analysis techniques. The purpose of this study is to discover how college students and instructors perceive collaborative group work within a learning context, including: (a) the value that each constituency places upon collaborative group activities, (b) the factors each constituency believes contribute to successful collaboration, and (c) the expectations of accountability to successful collaboration that each constituency assigns to the other. Findings will provide insights into the practical implications for designing and facilitating collaborative learning groups by informing instructors and instructional designers of perceptual similarities and differences between students and instructors.

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Study Design

This study was designed to be non-experimental. As a non-experimental study it did not include either variable manipulation or randomized sampling (Pedhazur & Schmelkin, 1991, p. 304). Consistent with the outcome of much non-experimental research, the emphasis of this study was to describe an existing phenomenon and investigate its current status (McMillan, 2004, p. 176). The non-experimental focus of this study was exploratory and utilized descriptive statistics to provide general information about the distinct groups of participants and correlational statistics to investigate relationships between study variables. McMillan (2004) states that while descriptive statistics help describe a particular phenomenon, correlational statistics aid in the preliminary identification of relationships among variables that warrant further research. This study also employed non-numerical data to gain a greater level of detail from the participants, applying a qualitative data analysis that is interpretative, iterative, and holistic (Creswell, 2003). Qualitative analysis is adaptable to the situation and emphasizes discovery and emergence of data-driven themes (Glaser & Strauss, 1967).

The study's survey methodology takes into consideration the educational context and variety of data types needed to address the research questions. A cross-sectional online survey captured data on participant demographics and perceptions of group learning. The survey, as a research design, is well-suited to be used as a descriptive method of measuring "important educational and social variables in a realistic setting" (Nisbet & Entwistle, 1970, p. 15). In particular, a survey design provides a way to collect data that describes attitudes, opinions, behaviors, or characteristics of a population (Creswell, 2003). Surveys are also useful for examining relationships between variables

that address a wide range of concerns (McMillan, 2004). A number of studies effectively used the survey design to measure a diversity of group attitudes and factors. (See for example, Hansen, 2006; Napier & Johnson, 2007; Nevgi et al., 2006; Kreijns et al., 2004; Scribner et al., 2003.) Online delivery of the survey allowed for rapid development and deployment of the instruments and provided a greater level of convenience for the survey participants.

Population Profile and Participation Criteria

The target population for this study consisted of males and females of diverse nationalities from institutions of higher education associated with IDT programs across the United States. This study involved two distinct population sub-groups: college-level learners, and college instructors. The field of IDT was targeted because it consists of learners and instructors whose higher education academic experience likely involves collaborative group learning as part of coursework and whose professional work involves working in teams. With time as a major consideration for this survey, the short window for participation ultimately led to the decision to open the survey to a wider population of learners and instructors from many IDT programs instead of attempting to get a high response rate from only a few IDT programs. The rationale for this decision was also based in a belief that opening the survey to a wider audience would increase study quality by providing data with greater diversity.

The research occurred at the end of the Fall 2009 semester and only included IDT students or instructors who had been involved in collaborative group learning activities within the past twelve months. For the purposes of this study, collaborative group learning had been defined for potential participants as including the following:

- an informal setting, in full or in part, where group members decide time and place of at least some group meetings; some group meetings can occur during dedicated classroom time (Pfaff & Huddleston, 2003; Thompson & Ku, 2006);
- an informal structure where group members decide on tasks, roles, and other group functions; consultation with instructor may occur (Crook, 1995; Lewis, 1997; Volet & Mansfield, 2006);
- small groups comprised of three-five members (Schellens & Valcke, 2006; Gros, 2001; Thompson & Ku, 2006; Pfaff & Huddleston, 2003);
- an ill-structured project or problem (e.g., design/development project) (Choi & Lee, 2009; Crook, 1995; Volet & Mansfield, 2006); and
- a time frame on project or problem was at least three weeks that could either be sequential or non-sequential (Hansen, 2006; Pfaff & Huddleston, 2003).

The selection criteria ensured that study participants have been involved in similar collaborative group learning contexts even though they came from different institutions involved in different courses and programs.

This study directly contacted 463 individuals representing 40 IDT programs. In addition, as part of a networking strategy to increase awareness of the study within the target population, 23 IDT program directors were contacted requesting that they inform learners and instructors in their programs about the opportunity to participate in this study. As a result, the exact number of participants contacted is not known but likely exceeds 463. Of the 463 invitations sent directly to the target IDT population there were 123 (26.6%) responses of which 91 (19.7%) confirmed meeting the selection criteria and,

therefore, completed the survey. There is no stated minimum number of subjects required for a non-experimental descriptive study. However, as a non-experimental correlational study, a minimum of 30 participants is recommended in order to reduce the chance of mistaken identification of relationships between variables (McMillan, 2004).

Sample and Sampling Procedures

The study utilized a purposeful, criterion-based sampling design. The purposive sampling selection process involved stratification based on specific demographic and experiential criteria. This type of sampling was acceptable because randomized sampling is not necessary in non-experimental research (Pedhazur & Schmelkin, 1991). The primary rationale for using this type of sampling process was to identify and acquire information-rich cases by specifically targeting learners and instructors with a high likelihood of being involved in group learning as part of the academic experience in higher education.

To further refine the sample, the participants' recent academic experience was used as a filter to provide a "typical case" representative of the desired population (McMillan, 2004, p. 114). This filtering was accomplished by asking potential participants to self-select out of the study if they did not meet the criteria for collaborative group learning as defined for this study. In addition to the purposive and criterion-based sampling design, network sampling was used to increase awareness of the opportunity to participate in the study by encouraging individuals and IDT programs to share the invitation to participate with others. Network sampling is useful when there are a limited number of initial participants and can occur simultaneously with data collection (McMillan, 2004, p. 115).

Instrumentation

To answer the research questions of this study the researcher developed and pilot tested two closely related multi-part surveys consisting of closed- and open-ended questions. Although similar in structure and question purpose, each survey addressed the distinction between learner (see Appendix F for Learner Survey) and instructor (see Appendix G for Instructor Survey). With only two exceptions, all closed-ended questions used a six-point Likert scale rating with the following item choices: (1) strongly disagree, (2) disagree, (3) slightly disagree, (4) slightly agree, (5) agree, and (6) strongly agree. These six items avoid a “neutral” response and provide a greater degree of response variation for the participants. The two questions in exception to the six-point Likert scale items instead assess a range of instructor/student assignment of responsibility for group learning with the following five choices: (1) 100% instructor, (2) 75% instructor/25% students, (3) 50% instructor/50% students, (4) 25% instructor/75% students, and (5) 100% students. The open-ended questions in this survey asked participants to explain more fully their answer to closed-ended questions or to describe in detail their experiences, beliefs, or “perceptions” regarding collaborative group learning.

The instruments for both the student and instructor groups in this study were administered via an online survey program hosted by Virginia Polytechnic Institute and State University. Each survey began by informing the participant about the purpose of the study, gave instructions for taking the survey, and included a reiteration of the definition of collaborative group work used for this study. Both surveys consisted of eight sections: (1) general information about recent collaborative group experiences, (2) demographic information, (3) attitudes toward and satisfaction with collaborative group learning, (4)

perceptions of the value and benefits of collaborative group learning, (5) perceptions of the instructor's role in collaborative group learning, (6) factors affecting collaborative group learning, (7) efficacy of self and others using group skills, and (8) willingness to participate in group learning activities.

The learner survey consisted of 38 questions: 26 six-point Likert scale items, two instructor/student accountability range items, and ten open-ended response questions. The instructor survey included an additional Likert scale item, for a total of 39 questions. Table 1 shows the alignment of the survey sections and question types to the research questions.

Learner Survey

The first instrument developed for this study was an online survey for college-level learners (see Appendix F). The general information section of this survey gathered data about the learner participants' most recent academic work by capturing information about their actual group learning involvement as learners (see Recent Group Learning Experiences in Appendix F). The data collected in this section provided background information concerning the specific coursework the learner participant deemed collaborative based on the criteria defined during the self-selection process (see Pre-Survey Information in Appendix F). Demographic information for each learner participant concerned gender, age, nationality, professional experience, and frequency of group work as a professional (see Demographic Information in Appendix F). The collection of professional experience data was based upon research by Scribner et al. (2003) indicating that positive attitudes toward collaborative group learning result from having had professional work experience that involved working in groups.

Table 1

Survey Alignment to Research Questions

Research question	Survey section	Question type	
		Instructor	Learner
1. What is the perceived value of collaborative learning groups held by college-level learners and instructors?	Value and Benefit	CE (5)	CE (3)
		OE (2)	OE (2)
2. What accountability to successful collaborative learning groups do college-level learners and instructors assign each other?	Instructor Role	CE (8)	CE (8)
		OE (2)	OE (2)
3. What factors do college-level learners and instructors believe contribute to successful collaborative group learning?	Factors Affecting Collaborative Group Learning	OE (2)	OE (2)
Demographic and miscellaneous data	Attitudes and Satisfaction	CE (4)	CE (4)
	Demographics	CE (6)	CE (5)
		OE (1)	OE (1)
	Recent Group Learning Experience	OE (1)	OE (1)
	Efficacy of Self and Others	CE (2)	CE (3)
	Others	OE (1)	OE (1)
	Willingness to Participate	CE (4)	CE (5)
		OE (1)	OE (1)

Note. Question type, then number of questions in parentheses. CE = Close-ended. OE = Open-ended.

The attitudes and satisfaction section measured the learner participant's perception regarding collaborative group learning in these areas (see Attitudes and Satisfaction in Appendix F). Attitude questions in this section provided data on the learner participant's current disposition toward and belief about the importance of collaborative group learning as a learning method. The satisfaction questions provided data about the learner participants' contentment with the outcomes and experiences resultant of his or her involvement in collaborative group learning. Determining the perceived level of learner participants attitudes and satisfaction as factors of collaborative group learning is supported in the literature (Chapman and Auken, 2001; Napier and Johnson, 2007). As previously described, the connection between attitude and satisfaction is an iterative phenomenon where the outcome of the collaborative group learning experience (satisfaction) spawns or validates a belief about its effectiveness as a learning method (attitude) that produces an expectation regarding similar situations in the future (see p. 63). This section was a secondary concern and was not used in analysis.

The questions in the survey section on value measured the learner participant's perceived value of collaborative group learning as a method of learning that supports the achievement of his or her learning and career goals (see Value and Benefit in Appendix F). The questions in this section built on research that finds that learners base their perceptions of collaborative group learning upon the alignment of the activity to academic and professional goals (Scribner et al, 2003; Volet & Mansfield, 2006; Woolf & Quinn, 2009). In addition, the learner participants described their beliefs about the value and benefits of collaborative group learning and explained why they believed instructors assign collaborative group activities. This information provided richer details

of perceptions of value and benefits and allows comparison between learner participant and instructor participant beliefs about the value of collaborative learning. The alignment of value variables to questions in the learner survey appears in Table 2.

Table 2

Learner Survey: Value Variable Alignment to Research Questions

Variable	Survey question
Supports learning goals	Collaborative group learning supports the achievement of my learning goals.
Pedagogical value	Collaborative group learning is an effective instructional method of learning for me.
Professional Benefit	Participating in collaborative group learning will be beneficial to my future career.

Note. Research question: What is the perceived value of collaborative group learning held by college-level learners?

The survey section on perceptions of the instructor’s role is based upon research by Chapman and Auken (2001) and Hansen (2006) that finds that the role of the instructor affects learner attitudes toward and satisfaction with collaborative group learning. The questions in this section measured and described the perception learner participants hold of the instructor’s role as well as the assignment of accountability for success in the collaborative group learning process (see Instructor Role in Appendix F). Data captured in this section provided a snapshot of learner expectations regarding the instructor and accountability for success in a collaborative group learning environment. In particular, these data permit direct comparison between learner participant and

instructor participant perceptions in this area. Table 3 shows the alignment of instructor role variables to questions in the learner survey.

Table 3

Learner Survey: Instructor Role Variable Alignment to Research Questions

Variable	Survey question
Leave students alone	Students need to be left alone and discover for themselves how to resolve issues that arise within the group.
Active instructor	Instructors should play an active role in collaborative group learning activities.
Group Process Accountability	In a collaborative group learning environment, whose responsibility is it to ensure that a group works effectively?
Learning Process Accountability	In a collaborative group learning environment, whose responsibility is it to ensure that the learning process is supported?

Note. Research question: What accountability to successful collaborative learning groups do college-level learners assign to themselves and their instructors?

The section on factors effecting collaboration was exploratory and was not based on any specific research existent in the literature. Instead, the questions in this section were used to provide insight into the actual lived experiences and beliefs about collaborative group learning held by the learner participant (see Factors Effecting Group Learning in Appendix F). The data collected from this section helped to develop an understanding about the personal experiences of learner participants and their beliefs about the positive and negative factors that contributed to those experiences.

The survey section on self-efficacy was a self-assessment of the learner participant's own social and group skills (see Efficacy of Self and Others in Appendix F). In addition to assessing themselves, learner participants gave a general assessment of other students' and instructors' social and group skills. The questions in this section are based upon several studies that find that perceptions concerning group learning are based upon the ability of the individuals within the group to function as a group (Hendry et al., 2005; Nevgi et al., 2006; Napier & Johnson, 2007). Of a secondary concern, the variable score for social and group skills is used in data analysis to measure its effect as an independent variable and comes from the personal self-efficacy question: I have the social and group skills needed to work effectively in a group.

The section on the willingness to participate measures the learner participant's satisfaction and preferences regarding participation in future group learning activities (see Willingness to Participate in Appendix F). The questions in this section are strongly tied to research indicating that learners' preferences, prior experiences, and satisfaction with group learning affects their perception of group learning and their willingness to participate in future group activities (Chapman & Auken, 2001; Napier & Johnson, 2007; Thompson & Ku, 2006). The participation preference variable is a secondary concern used to measure its affect as an independent variable and comes from the question: I prefer to work alone when learning.

Instructor Survey

The second instrument used in this study was an online survey of college instructors the researcher developed (see Appendix G). Because question purpose was aligned very closely to the online survey for college-level learners (see p. 101 for

description), in most cases the only difference in the two surveys was a slight variation in wording to make questions appropriate to the two distinct sample sub-groups. However, in a few cases, the wording was changed to reflect the instructor's perspective. For example, the section on willingness to participate was changed to capture the instructor's willingness to include, monitor, and engage in collaborative group learning experiences in his/her courses.

The general information section of the instructor survey covers the most recent collaborative group learning activities in the instructor participants' courses (see Recent Group Learning Experiences in Appendix G). While gathering the same demographic information for each instructor participant as was gathered for each instructor participant (gender, age, nationality, professional experience, and frequency of professional group work), the survey adds a question about the instructor participant's years of instructional experience (see Demographic Information in Appendix G).

The attitudes and satisfaction section of the survey captures the instructor's overall perception of collaborative group learning (see Attitudes and Satisfaction in Appendix G). For the instructor participants, attitude measured disposition toward collaborative group learning as an instructional method and satisfaction measured contentment with student outcomes and experiences from collaborative group learning activities. Researchers Ahern (2007) and Chapman et al (2006) recommend gathering information about instructor perceptions regarding collaborative group learning, and such data can provide a point of reference to compare with learner perspectives.

The survey section on value and benefit of collaborative group learning collected data on the instructor participant's perception of collaborative group learning as a method

of instruction that supports the achievement of his or her student’s pedagogical and professional goals (see Value and Benefit in Appendix G). The instructional alignment of collaborative group activities with a learner’s academic and career goals influence his or her perception of the activity (Volet & Mansfield, 2006; Woolf & Quinn, 2009). Furthermore, instructors themselves have mixed beliefs about the benefits of collaborative group learning. While believing collaborative group learning to be important to professional skill building, many instructors do not value it as an instructional method (Ahern, 2007). This section specifically asked instructor participants to describe why they assign collaborative group activities as part of their instruction. As recommended by previous research (Chapman et al., 2006), this information would provide a basis for comparing learner participant and instructor participant responses. The alignment of value variables to questions in the instructor survey appears in Table 4.

Table 4

Instructor Survey: Value Variable Alignment to Research Questions

Variable	Survey question
Supports learning goals	Collaborative group learning supports the achievement of my student's learning goals.
Pedagogical value	Collaborative group learning is an effective instructional method of learning for my student's.
Professional Benefit	Participating in collaborative group learning will be beneficial to my student's future career.

Note. Research question: What is the perceived value of collaborative group learning held by college instructors?

The instructor role section of the survey aligned directly with the student survey (see Instructor Role in Appendix G). Based on research that the role of the instructor has a direct impact on learner perceptions of collaborative group learning (Chapman and Auken, 2001; Hansen, 2006), the questions in this section gathered comparative data for learner and instructor participant perceptions as prescribed by previous research (Chapman et al., 2006). Table 5 shows the alignment of instructor role variables to questions in the instructor survey.

The survey section on group factors collected exploratory data regarding instructor participants' perceptions about positive and negative group experiences in courses that implemented collaborative group learning activities (see Factors Effecting Group Learning in Appendix G). The self-efficacy section includes a self-assessment of the instructor participant's social and group skills as well as a general assessment of the group skills level of his or her students (see Efficacy of Self and Others in Appendix G). The self-efficacy variable is used as an independent variable and comes from the question: I have an understanding of the social and group skills needed to work effectively in a group.

The questions in the willingness to participate section measured the instructor participant's perception and preferences regarding participation in group learning activities (see Willingness to Participate in Appendix G). This section is largely based upon Ahern's (2007) report that instructors see collaborative group learning as too time consuming, lacking in individual student accountability, and difficult to assess fairly. Willingness to participate is used as an independent variable and comes from the

question: I proactively monitor and intervene in the collaborative group learning activities in my courses.

Table 5

Instructor Survey: Instructor Role Variable Alignment to Research Questions

Variable	Survey question
Leave students alone	Students need to be left alone and discover for themselves how to resolve issues that arise within the group.
Active instructor	Instructors should play an active role in collaborative group learning activities.
Group Process Accountability	In a collaborative group learning environment, whose responsibility is it to ensure that a group works effectively?
Learning Process Accountability	In a collaborative group learning environment, whose responsibility is it to ensure that the learning process is supported?

Note. Research question: What accountability to successful collaborative learning groups do college instructors assign to themselves and their students?

Pilot Study

A pilot study tested the effectiveness of each of the survey instruments. The pilot study furthered the development and design of the instruments through gathering feedback on question suitability, survey processes and structure, grammar usage, and term ambiguity. The pilot study refined the individual questions and clarified instructions and procedures for these newly created instruments. The pilot study consisted of two phases. The first phase focused on testing the accuracy and clarity of the survey questions. The second phase of the pilot study focused on testing the online

implementation of the survey instruments and helped to further refine question wording and appropriateness.

In phase one of the pilot study a blank copy of the electronic file containing the survey was sent to pilot participants. Each participant in the student group and instructor group was asked to fill out the appropriate survey in word-processed format and return it to the researcher by email. Five student participants and two instructor participants completed the pilot.

In addition to providing sample data for each question, participants provided unrestricted feedback on all aspects of the survey, including recommendations on how it could be improved. Spreadsheet software served as a work area for compiling summary descriptive analysis and coding notes about data and feedback. This process provided the basis for refining both survey instruments' formats, and the results were invaluable in informing the survey design as it moved toward final implementation. One of the chief issues from the pilot concerned the length of the survey. Although the goal was to develop a 15 to 20 minute survey, several participants reported that to complete either of the original surveys took well over 30 minutes.

Findings from the first phase of the pilot study identified redundant questions and helped refine question wording to better obtain the type of data needed to answer the research questions. Discovery that some of the closed-ended questions were biased meant modification to wording to make them more neutral. In some cases, open-ended questions replaced the closed-ended questions, allowing participants to provide more complete responses. Overall, the main finding from the first phase of the pilot study was the need to align the student and instructor surveys more closely so that the data collected for the

majority of questions fulfills the same question purpose. As the two surveys matured, the aim became to make the two surveys nearly identical, while still maintaining the distinctions needed for the individual sample groups.

The second phase of the pilot study tested the online procedures and surveys as they would appear to the real study participants and included the testing of user acceptance of the e-mail invitation, the informed consent process, and survey functionality. This phase of the pilot study focused on fine tuning survey procedures in the online environment, aligning question purpose between surveys, and refining question wording to be more concise and clear. Only the peer debriefing team of three individuals and research advisor participated in phase two of the pilot study.

Because of question deletion to make the survey(s) shorter, a concern in phase two of the pilot study was to ensure that the study still generated enough data to address the research questions. In response, phase two re-admitted several questions and developed several new questions that captured the desired data. Thus, the instructor survey included a section on willingness to participate previously only given to learner participants. The literature basis for this section required that it did not align as strongly to the learner version as other sections but ultimately provided data in a sparsely researched area. Phase two of the pilot study improved procedures and technology usage so that the final surveys: (a) possessed clear and concise questions, (b) met the time commitment goals, and (c) addressed the research questions adequately.

Data Collection Procedures

On October 22, 2009, the Institutional Review Board of Virginia Polytechnic Institute and State University granted approval to conduct the study (see Appendix A).

The window for collecting data began on December 11, 2009, and ended on December 31, 2009. Two separate hosting servers at Virginia Polytechnic Institute and State University were used for data collection: one server housed the informed consent process, and another housed the online survey. An invitation to participate e-mail sent on December 11, 2009 initiated the data collection (see Appendix B). A reminder invitation to participate e-mail followed on December 21, 2009 (see Appendix C), and a final reminder e-mail invitation to participate (see Appendix D) was sent on December 30, 2009. All e-mail invitations to participate noted December 31, 2009 as the final date to participate in the study.

As a purposeful sample, the researcher contacted IDT instructors and students from major IDT programs across the United States. A contact list of possible participants was developed after identifying IDT programs in the latest edition of the Educational Media and Technology Yearbook (Orey, McClendon, & Branch, 2009). This process entailed searching each identified IDT program website for personal e-mail contact information and saving it to a spreadsheet. This method worked well for gathering contact information for instructors but not for students. Early in the process, contacting the IDT program directors and requesting that they disseminate the invitation to participate e-mail to students became necessary (see Appendix H).

Each invitation to participate e-mail supplied an overview of the research and included a web link to the informed consent form for the survey. Before taking part in the study each participant completed an online informed consent form (see Appendix E). Also before beginning the survey, the participant was informed of the specific criteria defining collaborative group learning (see Pre-Survey Information in Appendix F and

Appendix G). Participants were asked to remove themselves from the study if their collaborative group learning experiences did not meet the specified criteria.

The online survey began by informing the participant about the purpose of the study and provided instructions for taking the survey, and again defined collaborative group learning activities for this study. The participant was informed that the estimated time needed to complete the survey was approximately 15 minutes. The initial survey questions asked participants for general information about the types of group work with which they have had experience and for demographic information describing their professional backgrounds. The survey then asked participants about their perceptions concerning collaborative group learning in a variety of areas: attitude and satisfaction, value and benefit, and the role of the instructor. The survey continued by asking participants to describe their experiences and explain their beliefs about the factors contributing to effective collaborative group learning. The survey also asked participants about their perceptions in areas of secondary concern: efficacy of self and others regarding group skills and willingness to participate in collaborative group learning.

The survey concluded by inquiring about the participants' interest in being contacted in follow-up research and asking for recommendations for possible participation in the current study. The follow-up research question asked participants if they wished to be included in future research associated with this study and, if so, voluntarily to provide contact information. Through a referral method of social networking, the recommendation for possible participation in the current study question provided an ancillary method of gaining contact information for potential participants with a high likelihood of meeting the sampling specification. The process asked study

participants, after having completed the survey, to supply e-mail addresses of others whom they believed met the criteria and who may be willing to participate. All referrals were contacted by email as outlined above.

Data Analysis Techniques

Non-experimental Data Analysis

This study analyzed learner and instructor data separately. However, to answer the research questions it employs the same statistical data analysis strategies for both data sets. Descriptive statistics for demographics were used for value variables (supports learning goals, pedagogical value, and professional benefit) and instructor role variables (leave students alone, active instructor, group process accountability and learning process accountability). Descriptive statistics provide a way to organize and describe data in a meaningful way that summarizes the characteristics of the sample (Creswell, 2003). Descriptive data is not only useful for developing an understanding of the characteristics of the sample; it is the starting point that supports other methods of statistical analysis that explore variable comparisons and relationships (Howell, 2007).

To examine the relationships between two variables the Pearson product moment correlation coefficient (Pearson's r) determined the degree of the relationship while simple regression determined the form of the relationship. Examining the relationship between two variables necessitates determining the direction and strength of the relationship expressed as correlation coefficients (McMillan, 2004). For statistically expressing the degree or strength of a relationship between two random variables, a bivariate correlation, such as Pearson's r , is appropriate (Howell, 2007). As a suitable method of data analysis for non-experimental designs, regression analysis was used to

statistically express the direction of the relationship because it is a measure of the predictive relationship between the predictive variable and the criterion variable (Pedhazur & Schmelkin, 1991). When multiple predictor variables were examined, multiple regression analysis was used in the data analysis because it allows researchers to determine the relative contributions of each predictor variable on the criterion variable (Howell, 2007).

To determine whether significant differences existed between group means, an independent-sample *t-test* was used when only two groups were involved and a one-way analysis of variance (ANOVA) was used when there were more than two groups involved. Both of these types of tests for significance differences in means are appropriate for non-experimental research (Pedhazur & Schmelkin, 1991). While the *t-test* is useful for determining the level of significant of difference that may exist between two groups, ANOVA allows any number of groups means to be compared (McMillan, 2004). For any overall significance found in ANOVA comparisons, Tukey's HSD post hoc test determined the exact location of the significant difference. Tukey's HSD is a useful follow-up comparison test for pairwise differences commonly used in post hoc tests because of its control over the level of significance (Howell, 2007).

All variable scores were coded as numerical variables for use in statistical analysis. Likert scale items were coded as: Strongly Disagree = 1, Disagree = 2, Slightly Disagree = 3, Slightly Agree = 4, Agree = 5, and Strongly Agree = 6. For the responsibility rankings the coding was: 100% instructor = 1, 75% instructor/25% students = 2, 50% instructor/50% students = 3, 25% instructor/75% students = 4, and 100% students = 5. Demographic variables were also given numeric codes as follows:

- Gender: Female = 1, Male = 2
- Age: 20 to 29 = 1, 30 to 39 = 2, 40 to 49 = 3, 50 to 59 = 4, 60 to 69 = 5, 70 or above = 6
- Years of experience as an instructor: None = 1, 1 to 5 = 2, 6 to 10 = 3, 11 or more = 4
- Years of experience working as a professional: None = 1, 1 to 5 = 2, 6 to 10 = 3, 11 or more = 4
- Years of experience working in IDT: None = 1, 1 to 5 = 2, 6 to 10 = 3, 11 or more = 4
- Frequency of group work in professional career: Never = 1, Seldom = 2, Occasionally = 3, Often = 4, Always = 5

To investigate the perceived value of collaborative group learning held by college-level learners and instructors, three value variables were used: (1) supports learning goals, (2) pedagogical value, and (3) professional benefit. Each value variable was examined separately as a dependent variable with demographics as independent variables using multiple regression analysis to determine if any relationships were present. To determine if significant differences existed among group means, an independent-sample *t-test* was used for the demographic variable gender, and one-way ANOVA was used for the remaining demographic variables. A bivariate correlation was used to explore whether relationships existed between any of the value variables or the secondary concern variables (social and group self-efficacy and participation preference).

To investigate college-level learners' and instructors' perceived expectations of accountability for success in collaborative group learning, four instructor role variables

were used: (1) leave students alone, (2) active instructor, (3) group process accountability, and (4) learning process accountability. Each instructor role variable was examined as a dependent variable with demographic as independent variables using multiple regression analysis to determine if any relationships existed. To determine if significant differences existed among group means, an independent-sample *t-test* was used for the demographic variable gender, and one-way ANOVA was used for the remaining demographic variables. A bivariate correlation was used to explore whether relationships existed among the four instructor role variables or the secondary concerns variables (social and group self-efficacy and participation preference).

Qualitative Data Analysis

The research question concerning the factors believed to contribute to successful collaborative learning groups, as well as other qualitative data gathered in the survey, was analyzed using a constant comparative approach that employed coding, memoing, and sorting in anticipation of identifying emerging themes (Glaser & Strauss, 1967). Defining the process outlined for qualitative data analysis adds credibility to the study by clearly documenting the systematic progression through the data and tracing the dynamic development of the findings (Strauss & Corbin, 1990). Creswell (2003) outlines the following general steps for analyzing qualitative data: (1) organize and prepare data, (2) get an initial impression by reading through all data, (3) code data, (4) describe data through categories and themes, (5) write-up findings, and (6) interpret the data.

Generally, the analysis of the qualitative data in this study began by reading the textual data gathered throughout the survey and applying open coding to identify and categorize any existing phenomena. Selective coding in iterative re-readings of survey

responses identified the central categories. Sorting was done to synthesize and structure categories in preparation of reporting the findings. Memoing was used to record any theoretical themes that emerged during iterative reading and coding cycles. All coding, memoing, and sorting activities were done in spreadsheet software.

Specifically, to analyze the qualitative data for value and instructor role, the researcher completed the following procedure:

1. Read through all responses to get an overall sense of the data.
2. Read through all responses a second time and highlighted relevant words or phrases in light of the research questions posed.
3. Read through all responses a third time and coded each word or phrase that had been highlighted based on an interpretation of meaning and context.
4. Read through all responses a fourth time, ensuring that coding was consistent throughout and accurately represented the participants intended meaning.
5. Sorted responses according to code and made adjustments to individual response coding when reinterpretation of meaning was altered in context of other responses.
6. Read through code-sorted responses and developed categories of responses based on common themes reflective of the research questions posed.
7. Sorted code-sorted responses according to category, again focusing on the accuracy and consistency of coding and interpretation.

8. Memoing was done throughout the process to record the researcher's thinking as it developed, and was essential to the refinement of coding, categorizing, and narrative development.

The reporting of findings used qualitative narrative to describe generally the phenomena that existed for the individual learner and instructor sample groups. The write-up included portraying multiple perspectives and connecting similar cases within the same area. Furthermore, the study synthesized the data from the different aspects of perceptions it addressed into an interconnected theme that represents the overall phenomena occurring in each sample.

For factors that contribute to collaborative group learning experiences, analysis of qualitative data used selective coding to categorize and sort data. Data collected were analyzed separately for positive and negative factors using the following selective coding process:

1. Identification of key words or phrases within the participant's responses and condensing it to its most appropriate meaning.
2. Codes were then grouped into selected categories based on the researcher's interpretation of the meaning in context. The selected categories were:
 - a. Learner characteristics,
 - b. Group characteristics, and
 - c. Instructional characteristics.
3. Within each category the coded mentions were sorted into sub-categories describing activities, interactions, and attributes as follows:
 - a. Learning characteristics:

- i. Level of effort represented mentions of the learners' willingness to participate in the collaborative activity,
 - ii. Interactions with others represented mentions regarding learners' approaches to relations with other group members, and
 - iii. Individual attribute mentions represented specific learner traits that affected the collaborative experience.
- b. Group characteristics:
- i. Level of involvement mentions represented group members' engagement with the activity and within the group,
 - ii. Interactions among learners represented mentions of the methods and functions that affected the ability of the group to work together, and
 - iii. Member attribute mentions represented member qualities that had an effect upon group processes and functions.
- c. Instructional characteristics:
- i. Instructor role mentions represented functions assumed by the instructor during the collaborative process,
 - ii. Interactions with learners were mentions that represented the instructor's approach to interacting and communicating with learners, and
 - iii. Course attribute mentions represented specific design and implementation strategies used in courses.

4. Coded and sorted responses were analyzed for perceived intention to create a synthesis of the overall factors associated with collaborative experiences.
5. Data were presented in descriptive numbers and percentages, summary narrative, and example experiences.

Validity and Reliability

Validity and reliability need to be addressed in non-experimental and qualitative research. Validity supports the accuracy of the findings for the research, participant, and reader (Creswell, 2003). A validity concern for this study was its ability accurately to measure beliefs about perception that may be more complex in real life than reflected in the simple contrasts or dichotomies found in rating scales. To address this concern, open-ended questions complemented the closed-ended questions by providing opportunity for participants to expand their thoughts or supply reasoning for their choices. To further enhance validity for this study several strategies were implemented to check accuracy as suggested by Creswell (2003): (1) presentation of discrepant information to provide a full account of the responses, (2) peer debriefing as guidance for survey item development and process analysis, and (3) a reflective journal documented the researcher's own role, processes, and discovery.

To address reliability in this study, the researcher focused on developing consistency in the data collection procedures and instruments. Because this study employed two similar, yet distinct, instruments, it was important that the two surveys be aligned as closely as possible for the collected data to utilize the same analysis techniques and be useful for cross comparisons. Refining purpose and clarifying wording of questions while keeping them appropriate to the intended audience are, therefore, the

emphasis in survey design. A peer team and the Research and Consultation Lab of the Educational Research and Evaluation department at Virginia Polytechnic Institute and State University assisted in the development of the instruments.

Summary

The design used for this study was non-experimental with the purpose of exploring perceptions of collaborative group learning. The focus of this study was to provide general information about participants through descriptive data and to investigate relationships between study variables with correlational statistics. In addition, non-numerical data was gathered to provide a greater level of detail about participants' beliefs and experiences, and qualitative analysis was used to interpret and report the findings. A survey was used because it provided a way to collect the variety of data needed to address the research questions. The survey was administered online to provide a level of convenience for participants.

The target population for this study was college-level learners and instructors in higher education associated with a variety of IDT programs from across the United States. The primary criteria for participation in this study was that the learner or instructor needed to have been involved in collaborative group learning, as it was defined for the study, within the past twelve months. There were 91 responses that confirmed meeting the criteria to participate and completed the survey. The sample was designed to be a purposeful, criterion-based design; however, a network sampling strategy was later used to increase the reach of the survey through referrals.

Two closely related multi-part surveys consisting of closed- and open-ended questions were used in this study: one for college-level learners and one for instructors.

Both surveys consisted of the same eight sections with only minor differences in wording necessary to address the distinct audiences. A pilot study was conducted to test the surveys' effectiveness and was critical to improving question clarity, reducing time needed to take the survey, and increasing consistency between surveys. Once approval to conduct the study was received, data collection began on December 11, 2009 and ended December 31, 2009. Invitations to participate were sent by e-mail. Each e-mail invitation included an overview of the research and a web link to the informed consent form. After submitting their consent, participants were informed about the purpose of the study, given instructions, and advised of the definition of collaborative group learning used in the study. Participants that self-selected meeting the criteria completed the appropriate survey by answering question pertaining to demographics, perceptions, and experiences.

Non-experimental data analysis for this study included multiple regression analysis to test for relationships between study variables and demographic data. To test for between group mean differences, an independent *t-test* was used for gender, and one-way ANOVA was used for all other demographic data. For significance found in ANOVA comparisons, Tukey's post hoc test was used to determine the location of the difference. Bivariate correlation was used to investigate whether relationships existed among value variables. Bivariate correlation was also used to investigate if there were relationships among the instructor role variables. Qualitative data analysis used a grounded theory approach to identify emerging themes in participant open-ended responses. The qualitative analysis of responses for value and instructor role involved a process of iterative coding, memoing, and interpretive writing. Qualitative analysis of responses for contributing factors of positive and negative collaborative experiences used

a selective coding process. Validity was addressed through presentation of discrepant information, peer debriefing, and reflective journaling. Reliability was addressed by working with a peer team and the Research and Consultation Lab of EDRE to refine question wording and purpose, as well as alignment of survey instruments.

Chapter 4: Results

Overview of Data Collected and Analyzed

The study captured quantitative and qualitative data for learner and instructor participant perceptions of collaborative group learning. Two similar, yet distinct, survey instruments were used to collect data: a college-level learner's survey and a college instructor's survey. Quantitative data gathered in both surveys were analyzed using descriptive and correlational statistics. Multiple regression analysis was used to determine if any relationships existed between individual study variables as the criterion variable and the demographic variables as predictors. In addition, to determine if significant differences existed among group means, an independent-sample *t-test* was used for the demographic variable gender, and one-way ANOVA was used for the remaining demographic variables. To explore whether relationships existed among value variables a bivariate correlation was used. A bivariate correlation was also used to explore whether relationships existed between instructor role variables.

Qualitative data in the form of open-ended response questions were gathered for the value and instructor role sections for the purpose of clarifying closed-ended question choices. Open-ended questions were also used to collect descriptive responses in the section on factors affecting collaborative group learning and asked participants to elaborate on their beliefs and experiences regarding collaborative group learning. Qualitative data analysis involved open coding and selective coding and was reported using numbers and percentages, narration, and example experiences. The results of each survey are presented separately for each research question using descriptive, correlational, and qualitative analysis as appropriate.

Learner Survey Results

Survey Response and Data Screening

Of the 65 individuals who responded to the learner survey, 72.3% ($n = 47$) self-selected that they met the criteria for participation in the survey. McMillan (2004) recommends a minimum of 30 subjects for non-experimental correlation research, and descriptive and qualitative studies do not have a recommended minimum. All 47 subjects provided data; however, two subjects failed to respond to any of the questions in the section on instructor role. This section was not only essential to the research but contained eight questions that represented 31% (8 out of 26 questions) of the main survey. For these reasons, both cases were omitted from any analysis. The data for the remaining 45 subjects had missing responses in four cases; three of the cases had only one missing item, and one case had two missing items. None of the missing items were the same for any of the subjects, and all cases were kept for data analysis.

Data screening was simplified primarily because the instrument was administered over the internet using a browser-based form which allowed response items for closed-ended questions to be pre-coded for collection that ensured consistency. Data screening revealed that there was obvious confusion about the demographic question regarding the subject's nationality. This question was implemented as an open-ended question with the intention of capturing data on the subject's cultural background. However, the data screening process found that seven subjects thought the question was asking about race, and another six subjects failed to respond to the question altogether. Therefore, this question was deleted from the analysis.

Learner Demographics

In regard to gender, responses revealed that females comprised 61.4% ($n=27$) and males comprised 38.6% ($n=17$) of the 44 total participants who responded to this question. The overall age range of respondents was reported to be between 20 to 59 years, and no participants responded that they were over the age of 60. The 30 to 39 year range comprised 40% ($n=18$) of responses, followed by the 40 to 49 year range at 24.4% ($n=11$). The mean score for age fell in the 30 to 39 year range ($M=2.42$, $SD=.988$).

Of the 45 responses, none of the learner participants indicated that they had zero years of professional experience, while 46.7% ($n=21$) indicated that they had 11 or more years. Another 31.1% ($n=14$) of participants indicated that they had 6 to 10 years of professional experience, and 22.2% ($n=10$) indicated 1 to 5 years of experience. The mean score for years of professional experience fell in the 6 to 10 year range ($M=3.24$, $SD=.802$). For experience working in the field of IDT, 8.9% ($n=4$) responded that they had none. Scores in the range of 1 to 5 years represented the largest number of responses at 42.2% ($n=19$) as reflected in the mean score of 2.56 ($SD = .867$). Of the remaining scores for years of experience working in IDT, the 6 to 10 year range received 33.3% ($n=15$) of scores, and the 11 or more year range received 15.6% ($n=7$) of the scores. Regarding the frequency of group work in professional career, only one participant responded that he/she had never been involved in group work as a professional. The mean score for responses to the frequency of group work in professional career was 3.82 ($SD=.834$). The largest percentage of participants reported that they often worked in groups (60.0%, $n=27$), followed by those who occasionally worked in groups (17.8%,

$n=8$) and those who always worked in groups (15.6%, $n=7$). A summary of the demographics for learner participants is found in Table I.

Learner Results for Research Question One

Research question one asked: What is the perceived value of collaborative learning groups held by college-level learners and instructors? To investigate the perceived value of collaborative group learning held by college-level learners, three value Likert items from the “Value and Benefits” section of the survey were used: (1) supports learning goals, (2) pedagogical value, and (3) professional benefit. Descriptive statistics for each variable appears in Table J1. Demographic analysis consisted of descriptive statistics, correlational analysis, and between group mean difference tests. A bivariate correlation was used to explore whether relationships existed between any of the value variables or the secondary concern variables (social and group self-efficacy and participation preference).

Descriptive and demographics statistics for value variables. The mean score for supports learning goals fell in the slightly agree range ($M = 4.49$, $SD = 1.325$). The largest number of scores fell in the slightly agree range at 53.3% ($n=24$), followed by the strongly agree range at 15.6% ($n=7$). The slightly agree range received 11.1% ($n=5$) and the slightly disagree range received 11.1% ($n=5$). All other disagree ranges accounted for 8.9% ($n=4$) of scores. Descriptive statistics, means, and standard deviations for supports learning goals by demographics are provided in Table J2. The results of multiple regression between supports learning goals as the criterion variable and each of the demographic variables as predictors found no correlations of significance $F(5, 38) = .806$, $p > .05$ with $R^2 = .310$ and adjusted $R^2 = -.023$ (see Table J3 for summary). Testing for

between group differences found that there was not a significant difference between groups for gender, age, years of experience as a professional, years of experience in field of IDT, and frequency of group work in professional career. (See Table J8 for between group test results for all demographics.)

The mean score for the variable pedagogical value was in the slightly agree range at 4.38 ($SD = 1.512$) and while 77.8% ($n=35$) of the responses agreed at some level that collaborative group learning held pedagogical value, of these, 22.2% ($n=10$) were in slight agreement. Of scores disagreeing that collaborative group learning held pedagogical value, 6.7% ($n=3$) strongly disagree, 8.9% ($n=4$) disagree, and 6.7% ($n=3$) slightly disagree. Table J4 provides descriptive statistics, means, and standard deviations for pedagogical value by demographics. The results of multiple regression between pedagogical value as the criterion variable and each of the demographic variables as predictors found no correlations of significance $F(5, 38) = .737, p > .05$ with $R^2 = .088$ and adjusted $R^2 = -.032$ (see Table J5 for summary). Testing for between group differences found that there was not a significant difference between groups for gender, age, years of experience as a professional, years of experience in field of IDT, and frequency of group work in professional career.

The mean score for professional benefit was in the agree range ($M = 4.82, SD = 1.402$). Of all responses, 40.9% ($n=18$) strongly agreed that collaborative group learning has professional benefit to them, another 29.5% ($n=13$) agreed, and 13.6% ($n=6$) slightly agreed, while 15.8% ($n=7$) disagreed on some level. The descriptive statistics, means, and standard deviations for professional benefit by demographics are shown in Table J6. The results of multiple regression analysis between supports learning goals as the criterion

variable and each of the demographic variables as predictors found no correlations of significance $F(5, 37) = .467, p > .05$ with $R^2 = .113$ and adjusted $R^2 = -.007$ (see Table J7 for summary). Testing for between group differences found that there was not a significant difference between groups for gender, age, years of experience as a professional, years of experience in field of IDT, and frequency of group work in professional career.

Inter-correlations among value variables. Bivariate correlation was used to explore the relationship between five variables: the three value variables and the two secondary concern variables. Table 6 provides a correlation matrix among all five variables. Results revealed significant, positive correlations among the value variables: (a) supports learning goals and pedagogical value, $r(45) = .904, p < .001$; (b) supports learning goals and professional benefit, $r(44) = .791, p < .001$; and (c) pedagogical value and professional benefit, $r(44) = .792, p < .001$. For the secondary concern variables, there was a significant, positive correlation between supports learning goals and social and group skills self-efficacy, $r(45) = .294, p < .05$. There was also a significant, negative relationship between professional benefit and participation preference $r(44) = -.409, p < .001$.

Analysis of responses for value and benefit. Of the 45 learner participants, 66.6% ($n=30$) provided additional comments about factors believed to affect the value and benefit of collaborative group learning. Themes that emerged from the responses were collaborative characteristics, learner attributes, instructional effectiveness, and professional requirements. Words or phrases that exemplified these themes were mentioned by learner participants as follows: (a) collaborative characteristics comprised

60% (n=18) of mentions, (b) learner attributes received 50% (n=15) of mentions, (c) instructional effectiveness received 40% (n=12) of mentions, and (d) professional requirement received 10% (n=3) of mentions.

Table 6

Learner Results: Correlation Matrix for Value Variable

	1	2	3	4	5
1. Supports learning goals	-				
2. Pedagogical value	.904**	-			
3. Professional benefit	.791**	.792**	-		
4. Social and group skills self-efficacy	.294*	.210	.016	-	
5. Participation preference	-.182	-.292	-.409**	.116	-

** $p < .001$ (2-tailed)

* $p < .05$ (2-tailed)

Collaborative characteristic mentions included responses that referred to positive and negative attributes associated with the collaborative process that affected learners' perceived value of collaborative group learning. One characteristic of collaboration that was mentioned is the diversity in views and skills that a learner is exposed to during the collaborative process. This is a "definite plus" for Learner Participant 14 who felt that other learners provided ideas and insights that might otherwise be overlooked. Becoming aware of other's viewpoints can broaden the basis for solving problems, as Learner Participant 7 pointed out, "collaborative learning enables me to think more critically about the nature of the material I am learning, as I am exposed to different perspectives from other group members."

Responses identified consensus building as a way to develop a common goal to be a benefit associated with collaborative group learning. For example, Learner Participant 5 found that because collaboration involves being open to others perspectives and talents, it leads to “brainstorming a solution and then setting and achieving a goal.” In the experience of Learner Participant 29 such collaborative activities led to a better solution, “It is always good to share the perspectives of others. In most projects I work on, multiple perspectives [from] active, experienced professionals will result in an improved outcome.” Collaborative value resulting from diverse views and skills was summed up nicely by Learner Participant 9, who stated, “I like collaborative group learning because members who have different strengths and weakness can learn from each other and make a synergy to produce a better outcome.”

Though responses acknowledged that collaborative group learning outcomes had the potential to surpass what an individual might do alone, it was also recognized that the process was stressful. One form of stress associated with collaboration is due to its social context, as Learner Participant 38 attested, “My experience with collaborative group learning is that much is left to chance. The skills, ethics, and temperaments of individual members override any meaningful learning.” Group dynamics was reported to have the potential to positively or negatively affect learners’ perceived value of the collaborative activity. Learner Participant 35 related the following experience:

In those projects where I've clicked with my fellow team members and we've gotten deep into the work, the outcome has been VERY good. It takes a little ramp-up time to get to that point, and there is a risk that the group won't work well together. In those cases, the learning experience has not been as good at all, I

learned in spite of the project, instead of because of it. Those have been the minority by far, thankfully.

Much of the value associated with collaborative characteristics came from diverse group members sharing knowledge and experiences to help solve problems and reach a common goal. However, collaboration has an integral social dependency that can be aggravated by the same diversity that feeds its benefits.

Mentions of learner attributes by learner participants' referenced words or phrases that portrayed learning preferences and feelings associated with loss of control over the learning process as factors that affected learners' perceived value of collaborative group learning. To learners, like Learner Participant 29 who "primarily learns from interacting with others," collaborative group learning was seen as an opportunity to engage in learning that met individual learning preferences and goals. In contrast, other learners believed they learned best when learning alone and found little value in collaborative group learning. Learner Participant 39 explained, "I prefer to work independently and have enough experience in the field that I don't believe collaborative activities provide benefits to me." Preference for working alone is also related to the social context of collaboration, and for that reason Learner Participant 22 viewed it as an uncomfortable situation they would rather avoid. Addressing the social complexities of group dynamics, Learner Participant 34 warned that issues that arise within a group can be exacerbated by poor group skills, differing personalities, and a variety of work styles.

The responses suggested that the perceived value of collaborative group learning was associated with the loss of control over the learning situation. Learners reported being frustrated, especially when having to rely on others to do their part (Learner

Participant 24) or when having to work with less favorable group members (Learner Participant 2). Giving up autonomy was reported to be something that was difficult, especially when a learner perceived that “the focus of the group does not always meet my needs/wants as an individual learner” (Learner Participant 30). Seemingly in agreement, Learner Participant 47 found it to be personally challenging having to rely on others and build a consensus. Responses indicated that loss of control over the learning situation is not only about a common goal but also about the expected level of success:

We all have varying degrees of what is acceptable in our work....which is difficult. Violation of expectations happens with [the] time that things are due and level of workmanship that is put into it. Some people pull more weight than others, and I want my grade to reflect on how well I did, not how poorly others may have done. (Learner Participant 5)

For instructional effectiveness, the mention of work/grade inequality is most common but other words and phrases that appear are associated with appropriateness, relevance, and piece-work. In a collaborative environment learners have to manage their own learning process, as well as the group’s process, and Learner Participant 42 found this to be “frustrating as some group members inevitably contributed less than others.” Learner Participant 19 appeared more cynical of the collaborative process, “in execution it [is] typically a muddle where 1 or 2 people get stuck with more work.”

Reports of work disparity brought forth other negative learning implications, as reported by Learner Participant 19, “the project often just gets cut into individual work [that is] then glued together at the end to appear to be collaborative.” The implication of this piece-work approach, contended Learner Participant 33, was that it created a

situation where learners did not have the same opportunity to learn. While it might be effective for obtaining a grade, Learner Participant 5 was unsatisfied with the outcome because “it [made] me feel like I only learned that specific part instead of the whole.”

Instructional effectiveness also included mentions pertaining to the appropriateness of collaborative activities that called attention to the instructional goals of the activity itself. Inclusion of collaboration as part of the learning experience needed to be grounded in a practical application, not simply invoked on theoretical terms reported Learner Participant 24. The argument, as presented in responses, is that the rationale for including collaborative activities should be based on a practical application:

Unless work group management is part of the learning goal for the class, group work always includes additional effort that is not related to the official learning goal of the course. If learning to work in groups is not a main focus of the course then group work is not appropriate. (Learner Participant 33)

Responses also mentioned that the value of collaborative group learning is based upon expectations in the workplace. As Learner Participant 12 asserted, “Whether we like it or not, corporate America still functions by assigning projects to collaborative groups.” This belief resonated with Learner Participant 28, who stated, “Working in a group is an essential skill in the workplace, and therefore it should be incorporated into teaching and learning efforts.” Learner Participant 6 felt that assigning collaborative group learning was validated because authentic learning experiences will be an “everyday” benefit in a future career.

Summary of results and responses. The mean scores for supports learning goals ($M=4.49$, $SD=1.325$) and pedagogical value ($M=4.38$, $SD=1.512$) fell within the slightly

agree range, while the mean score for professional benefit fell in the agree range ($M=4.82$, $SD=1.402$). Professional benefit also had the smallest percentage of respondents in disagreement (15.9%, $n=7$) as compared to supports learning goals (20%, $n=9$) and pedagogical value (22.2%, $n=10$). Scores for the value variables showed that 80% ($n=36$) of responses agreed at some level that collaborative group learning supported their learning goals, 77.8% ($n=35$) agreed that it held pedagogical value, and 84% ($n=37$) agreed that it had professional benefit. For demographics, neither regression analysis nor testing for between group mean differences found any significance for supports learning goals, pedagogical value, or professional benefit.

Inter-correlations among the three value variables showed a significant, positive correlation among all of the value variables: (a) supports learning goals and pedagogical value ($p<.001$), (b) supports learning goals and professional benefit ($p<.001$), and (c) pedagogical value and professional benefit ($p<.001$). The strong, interrelationship that supports learning goals had with pedagogical value and professional benefit suggested that learners' perceptions of collaborative group learning were associated with its academic and professional value. The positive correlations indicated that learner participants more in agreement that collaborative group learning supported their learning goals were also more likely to agree that it was an effective method of learning. Similarly, learner participants that agreed that collaborative group learning supported their learning goals were also more likely to agree that it will benefit their future careers. In addition, the correlation between pedagogical value and professional benefit suggested that learner participants were likely to agree that collaborative group learning was both effective as a learning method and would be beneficial to them in their future career.

In addition, a significant, positive correlation existed between supports learning goals and social and group skills self-efficacy ($p < .05$). This result indicated that learner participants with lower social and group skills self-efficacy were less likely to believe that collaborative group learning supported their learning goals. A significant, negative relationship was found to exist between professional benefit and participation preference ($p < .001$), implying that those who preferred to work alone were less likely to value collaborative group learning as being beneficial to their future career.

From the factors believed to affect the value and benefit of collaborative group learning, four themes emerged: (1) collaborative characteristics, (2) learner attributes, (3) instructional effectiveness, and (4) professional requirement. Of all responses, collaborative characteristics received the most mentions and included comments about the effects of diverse experiences and group dynamics on the learning process. From an analysis of responses, it was suggested that a benefit of collaborative group learning is that having more learners involved in solving a problem means that more alternatives can be considered. Sharing of individual experiences, perspectives, and talents was reported to have a positive effect on the overall product as well as on individual achievement as a result of peer mentoring and knowledge sharing. However, responses pointed out that becoming collaborative as a group was challenging because it requires a reliance on others.

Besides having to overcome the obstacles of group dynamics, it was mentioned that learner attributes, such as work-alone preferences and issues of control over the learning situation have a profound effect upon the collaborative group learning experience. While some learners' simply preferred to learn on their own, others believed

that collaborative activities had little to offer to their academic achievement. The social context of collaborative group learning was reported to be a factor because of issues of social self-efficacy that made some learners uncomfortable. However, it appears that most of the social concerns regarding collaboration have to do with learners being required to get along with one another and be accepting of differing work styles, motivations, and expectations of success.

In regard to instructional effectiveness, inequities in work load and grade assignment highlighted many of the mentions. While the benefits of collaborative group learning were acknowledged, learners qualified their feelings by invoking such words as “frustrated,” “stuck,” and “shouldered.” Learners’ complaints regarding work and grade inequities are primarily associated with unfairness when some group members had to compensate for a lack of contribution on the part of other group members but in the end all were rewarded equally. From the responses of work load disparity, it was found that when collaboration degenerated to a piece-work strategy the product appeared to be collaborative, while in effect it left some learners feeling unsatisfied with the learning experience because learners were limited in what was learned and there was no synthesis of the aggregate knowledge.

Mentions of the appropriateness of collaborative group learning as an instructional method were based upon the notion that it should not be used on theoretical grounds alone. Instead, learners stated that the use of collaborative group learning activities should be a means of achieving specific instructional objectives supported by content, guidance, and relevance. Of which, the focus should be on learning to work in groups effectively; a necessity for the workplace according to mentions of professional

requirement. Responses coded for professional requirement found that the value of collaborative group learning was associated with the perception that the work place required working in teams. Collaborative activities were seen as a way for learners to develop the group skills and experiences necessary to be better prepared for their professional careers.

Learner Results for Research Question two

Research question two asks: What accountability to successful collaborative learning groups do college-level learners and instructors assign each other? To investigate college-level learners' perceived expectations of accountability for success in collaborative group learning, four variables were used: (1) leave students alone, (2) active instructor, (3) group process accountability, and (4) learning process accountability. Table K1 in Appendix L contains descriptive statistics for each of these instructor role variables. Demographic analysis consisted of descriptive statistics, correlational analysis, and between group mean difference tests. A bivariate correlation was used to explore whether relationships existed among the four instructor role variables and the two secondary concerns variables (social and group self-efficacy and participation preference).

Descriptive and demographics statistics for instructor role variables. The mean score ($M = 3.52$, $SD = 1.455$) indicated that, overall, respondents slightly agreed that students should be left alone during collaborative group learning activities. The largest percentage of responses (31.1%, $n=14$) slightly disagreed that students should be left alone, and 55.6% ($n=25$) of all responses disagreed at some level. However, 13.3% ($n=6$) of responses strongly agreed and 13.3% ($n=6$) of responses agreed that students should be

left alone. Descriptive statistics, means, and standard deviations for leave students alone stratified by demographics are provided in Table K2. The results of multiple regression between leave students alone as the criterion variable and each of the demographic variables as predictors found no correlations of significance $F(5, 38) = .584, p > .05$ with $R^2 = .071$ and adjusted $R^2 = -.051$ (see Table K3 for summary). Testing for between group differences found that there was not a significant difference between groups for gender, age, years of experience as a professional, years of experience in field of IDT, and frequency of group work in professional career. (See Table K10 for between group test results for all demographics.)

The mean score for active instructor was in the slightly agree range at 4.20 ($SD = 1.254$). The largest percentage of scores was in the slightly agree range (33.3%, $n=14$), and 75.6% ($n=34$) of all responses were in some level of agreement that instructors should play an active role in collaborative group learning. Scores that disagreed or strongly disagreed accounted for 11.1% ($n=5$). Table K4 provides a summary of descriptive statistics, means, and standard deviations for active instructors stratified by demographics. The results of multiple regression between active instructors as the criterion variable and each of the demographic variables as predictors found correlations of significance for years of experience as a professional, $F(5, 38) = 2.846, p < .05$ with $R^2 = .272$ and adjusted $R^2 = -.177$ (see Table K5 for summary). ANOVA testing for between group differences found that significant differences existed between groups for years of experience as a professional, $F(2, 42) = 5.272, p < .05$ and Tukey's multiple comparison found a significant difference between the group with 1 to 5 years of professional experience and the group with 11 or more years of professional experience. This result

suggested that those learners with more years of experience as a professional were more likely to agree that instructors should play an active role in collaborative group learning activities. Further testing found no significant differences for gender, age, years of experience in field of IDT, and frequency of group work in professional career.

Scores for group process accountability found that the majority of respondents (51.1%, $n=23$) felt that the range of responsibility for group processes should be 25% instructor and 75% students. The mean score was also in this responsibility range ($M = 3.80$, $SD = .815$). The 50% instructor and 50% students range of responsibility received 24.4% ($n=11$) of scores. Scores for the 75% instructor and 25% students range of responsibility accounted for 6.7% ($n=3$) of scores, while the 100% students responsibility range accounted for 17.8% ($n=8$) of scores. Descriptive statistics, means, and standard deviations for group process accountability by demographics are provided in Table K6. Multiple regression results found no correlations of between group process accountability as the criterion variable and each of the demographic variables as predictors significant $F(5, 38) = .224$, $p > .05$ with $R^2 = .162$ and adjusted $R^2 = .051$ (see Table K7 for summary). Testing for between group differences found that there were no significant differences between groups for gender, age, years of experience as a professional, years of experience in field of IDT, and frequency of group work in professional career.

The mean score for the instructor role variable of learning process accountability was 2.56 ($SD = .943$). The scores showed that 40.0% ($n=18$) of the responses felt that the split in responsibility for the learning process should be 50% instructor and 50% students. However, 33.3% ($n=15$) of scores fell in the 75% instructor and 25% students range of responsibility while 13.3% ($n=6$) fell in the 100% instructor range of responsibility.

Table K8 provides descriptive statistics, means, and standard deviations for learning process accountability stratified by demographics. The results of multiple regression to find if relationships existed between learning process accountability as the criterion variable and each of the demographic variables as predictors found no correlations of significance $F(5, 38) = .736, p > .05$ with $R^2 = .088$ and adjusted $R^2 = -.032$ (see Table K9 for summary). Testing for between group differences found that there was a not significant difference between groups for gender, age, years of experience as a professional, years of experience in field of IDT, and frequency of group work in professional career.

Inter-correlations among instructor role variables. Bivariate correlation was used to explore the relationship among the four instructor role variables along with the two secondary concern variables (social and group self-efficacy and participation preference). Table 7 shows a correlation matrix consisting of the Pearson's r correlation for all six variables. The results found that there were significant, positive correlations for leave students alone and active instructor, $r(45) = .314, p < .05$, and group process accountability and learning process accountability, $r(45) = .355, p < .05$. Significant, negative correlations were found for: (a) leave students alone and group process accountability, $r(45) = -.330, p < .05$; (b) active instructor and group process accountability, $r(45) = -.516, p < .001$; and (c) leave students alone and social and group skills self-efficacy, $r(45) = -.296, p < .05$.

Analysis of responses for instructor role. When learners were asked to identify what role(s) the instructor should play in collaborative group learning activities, 93.3% ($n=42$) responded with comments that portrayed three themes: (1) mentor with 38

mentions (90.5%), (2) facilitator with 35 mentions (83.3%), and (3) monitor with 34 mentions (81%). Mentor descriptors included words or phrases related to guidance and modeling during the collaborative process. Mentions of the instructor as a facilitator included depictions of the instructor providing structure, support, and resources. The role of monitor was described using words and phrases such as progress checks, intervene, and mediate by learner participants.

Table 7

Learner Results: Correlation Matrix for Instructor Role Variables

	1	2	3	4	5	6
1. Leave students alone	-					
2. Active instructor	.314*	-				
3. Group process accountability	-.330*	-.516**	-			
4. Learning process accountability	.210	.096	.355*	-		
5. Social and group skills self-efficacy	-.296*	.074	-.133	-.239	-	
6. Participation preference	.026	-.216	.164	-.049	.116	-

** $p < .001$ (2-tailed)

* $p < .05$ (2-tailed)

The indication from the analysis of responses is that one role of the instructor in collaborative group learning is to function as a mentor. Learner Participant 39 acknowledged that students understood that it is ultimately their responsibility to resolve issues and complete projects; however, they want help along the way. One way for the instructor to be involved is to act as a guide, commented Learner participant 4, especially when the group loses direction. Learner participant 27 clarified that a guide needed to be

aware of group processes and progress and be ready to step in when appropriate: “[the instructor] can monitor the activities within the group, and when we pose questions, [he or she] can jump in and give us some suggestions or insights.” The role of mentor and guide was not a passive mode simply waiting to offer guidance, Learner Participant 14 recommended that the instructor should be active in “keeping the group on task and helping [to] resolve issues/questions that arise.”

Mentoring is about modeling, according to Learner Participant 34, who added, “Students are not only learning content, but also how to work together.” Therefore, mentoring should include providing instruction on subjects related to working in group such as group formation, role assignment, communication, and conflict resolution (Learner Participant 33). Learner participant 10 also included informing the learner about collaborative models and leading discussion on responsibilities. As described by the following experience:

My instructor spent considerable time having us reflect on team building and communication skills ... [later on] my instructor had a guest speaker come in to talk to us about our work and communication tendencies, our preferences for dealing with colleagues and clients. It was very revealing and useful in helping my team accomplish our task with a minimum amount of conflict. (Learner participant 43)

Learner Participant 3 added clarification by commenting that mentoring is not based on taking over the project. Rather, it is an appreciation that group work involves dynamics in which some students lack experience. Learner Participant 19 believed that guided practice was needed during the process and admonished the hands-off approach: “This

whole, ‘hey group - if you have a problem then fix it yourselves [be]cause that’s how it works in the real world’ is not good teaching – it [is] a failure by the teacher to guide students properly.”

Allowing the students to direct their own learning is the goal. However, as Learner Participant 1 claimed, in order to maintain group effectiveness, it may be necessary for the instructor to “hold the ropes.” Leading and guiding can be done without taking over, as Learner Participant 18 pointed out: “Offer suggestions and let students come to conclusions that fit within the goals of the project.” One approach recommended by Learner participant 42 was to implement a scaffolding design that provided more support for learners at the beginning of the process and less over time.

Response analysis also showed that the role of the instructor was to facilitate the collaborative group learning process. Learner Participant 37 felt that guided approaches were too intrusive and suggested that the instructor should stay outside the process and let the group work, thereby allowing the learners to take responsibility of their own learning (Learner Participant 28). “The instructor should facilitate the learning rather than dictate it. Students who have more control over their own learning are more likely to have an enhanced learning experience,” declared Learner Participant 7.

Important to facilitating the process is having “clear expectations of anticipated outcomes,” claimed Learner Participant 24. Providing the instructional context is a start:

The instructor has to select appropriate assignments for group work and provide rubrics on how group work will be assessed. Goals need to be formulated that include what is to be learned from the group process as well as how any deliverables will be assessed. (Learner Participant 33)

Learner Participant 46 saw the facilitator as primarily concerned with “initiating and wrapping up group work.” Preparing the learners for the collaborative process was suggested by Learner Participant 23 to include structural support, establishment of timelines, and assisting in group selection. Facilitation might also include advice on group roles and functions added Learner Participant 29. The facilitator role is supportive of learning during the collaborative process by answering and clarifying questions (Learner Participant 7) and providing academic and technical tools (Learner Participant 31). “The instructor should help the learners access any information or tools required to independently complete the project at hand,” offered Learner Participant 30, who then added, “but the group is ultimately responsible for doing the work.” After initiating the project by providing guidelines, expectations, and advice, Learner Participant 44 stated that the instructor should “step away.” This is much like a “boss” who “is responsible for assigning tasks to the student/workers, but it is the student’s responsibility to meet the final goal,” commented Learner Participant 16. This professional comparison was echoed by Learner Participant 12: “The instructor is more or less a ‘senior-level supervisor’ and should only be bothered to clarify tasks/requirements or resolve major issues.”

In addition, responses regarding instructor role indicated that the instructor should play the role of monitor in the collaborative group learning process. Learner Participant 22 asserted that facilitating the process so that learners can take ownership of their learning is one thing. However, “The teacher should make sure that learning is taking place within a group.” Monitoring should entail being informed about a group’s functions and progress, stated Learner Participant 7. The responsibility of monitoring, as assigned to the instructor by Learner Participant 26, was to ensure that: (1) performance and

learning objectives were achieved, (2) all group members had an equal opportunity to participate, and (3) dialogue within the group was of value to the process. To monitor these learning activities a variety of methods need to be utilized. Learner Participant 9 recommended evaluations, such as exams and individual reflection, as a way to check individual learning progress. Equitable work load and group progress may be monitored by student-peer and student-instructor feedback loops, recommended Learner Participant 10. Learner Participant 42 suggested that feedback loops were effective ways to provide reporting on the “appropriateness of interactions, processes, and contributions.”

The caveat with monitoring, as with the other instructor roles mentioned in this study, has to do with the level of direct involvement by the instructor. The nuance of monitoring is to know when to intervene and with what measures asserted Learner Participant 46. The following perspectives relate the complexities of monitoring:

I have had experiences where a professor took the “guide on the side” mentality too far, in my opinion, and let a group flounder without guidance. Frustration with the group retards the learning process, so there is a point where a professor needs to step in and - gently and indirectly, if they prefer - suggest or draw out ways for the group to better communicate. (Learner Participant 35)

Conversely:

As the learning is open-ended, the instructor should only participate [if] group integrity is threatened and absolute failure is imminent. Collaboration is part of the lesson and too much "guidance" alters the learning event. On many projects the instructor only tacitly supervises but in others, when members cannot agree on

the process, the instructor might have [to] make changes in groups so that a learning event is effective. (Learner Participant 47)

Perhaps it was summed up best by Learner Participant 25, who stated that if things are going well, the instructor may only need to evaluate the final product, whereas, “In a disastrous team, the instructor's role is more involved and I'd say that the involvement can run the gamut of teams' needs.”

Summary of results and responses. The mean score for leave students alone was 3.52 ($SD = 1.455$). Of all respondents, 55.6% ($n=25$) disagreed on some level that students should be left alone to work out group issues; however, 26.6% ($n=12$) agreed or strongly agreed that students should be left alone. For active instructor scores, 75.6% ($n=34$) of respondents agreed on some level that instructors should play an active role in collaborative group activities, with the mean score ($M=4.20$, $SD=1.254$) falling in the slightly agree range. In regard to group process accountability, the mean score of 3.80 ($SD = .815$) and the majority of scores (51.1%, $n= 23$) fell in the 25% instructor and 75% students range of responsibility. While almost a quarter of responses (24.4%, $n=11$) fell in the 50% instructor and 50% students range of responsibility, 17.8% ($n=8$) fell in the 100% students range of responsibility. For learning process accountability, the mean score ($M=2.56$, $SD=.943$) was in the 50% instructor and 50% students range of responsibility, the option which also garnered 40% ($n=18$) of the responses; however, 33.3% of the scores were in the 75% instructor and 25% student range of responsibility.

The results of multiple regression between each instructor role variable as the criterion variable and each of the demographic variables as predictors found significant correlations in only one case, for active instructor and years of experience ($p<.05$).

Between group testing showed significant differences between groups for years of experience groups ($p < .05$), and Tukey's post hoc test found a significant difference between the group with 1 to 5 years of experience and the group with 11 or more years of experience. This result indicated that more experienced learners were more likely to feel that instructors should play an active role in collaborative group learning. Other than in this case, no other correlations of significance or differences between groups were found.

Inter-correlations found that a significant, positive correlation existed for leave students alone and active instructor ($p < .05$). This result indicated that learners who wanted to be left alone to resolve group issues still wanted the instructor to play an active role in the collaborative group learning activity. The results also found a significant, positive correlation for group process accountability and learning process accountability ($p < .05$). This result suggested that learners who were more willing to take responsibility for group processes were likely to assign instructors more responsibility for the learning process.

A significant, negative correlation was found for leave students alone and group process accountability ($p < .05$). This result implied that learners who assigned more of the responsibility for group processes to themselves did not want to be left alone, while students who took less responsibility for group process were more willing to be left alone. Another significant, negative correlation was found for active instructor and group process accountability ($p < .001$), this suggested that learners who believed instructors should take an active role in collaborative group learning were more likely to assign more responsibility to the instructor for ensuring that the group works effectively. Finally, a significant, negative correlation was found for leave students alone and social and group

skills self-efficacy ($p < .05$). This association suggested that learners who wanted to be left alone to work out issues that arose in the group were less likely to perceive themselves as having the social and groups skills needed to work effectively in a group.

Learner participants' responses regarding the role of the instructor in collaborative group learning activities revealed mentions that reflected functional themes of mentor, facilitator, and monitor. Response analysis found that a number of learners felt that the instructor should act as a mentor and guide during the collaborative process by offering appropriate directions, suggestions, and insight. Responses claimed that mentoring was not just in relation to learning content but also in relation to learning group process skills. Responses suggested that a mentor should provide an example of how collaboration is done without assuming control of the group processes. A scaffolding approach was recommended as one way to allow the group to be effective on its own over time.

Responses revealed that the mentor type of instructor involvement was too overbearing for some learners. In these students' view the instructor should be a facilitator of the process while giving the learners the responsibility of learning. It was suggested that the facilitator's main concern is to create the structure and context of the collaborative activity, and then support the process through providing responsive technical and tactical assistance, as well as any other resources needed. However, it was emphasized strongly that it is the learners' responsibility to do the work.

Monitoring to ensure that the learning process is effective is yet another role that some learners assigned to the instructor. Responses suggested that to monitor the process entailed having mechanisms in place to capture both the individual's progress and the progress of the group, thereby alerting the instructor when a group was not functioning

well and help determine if intervention was necessary. It was brought out in responses that being able to determine the need and mode for intervention was challenging because too much involvement would interfere with the learning process and too little involvement would demoralize it.

Learner Results for Research Question Three

Research question three is: What factors do college-level learners and instructors believe contribute to successful collaborative group learning? For factors that contribute to collaborative group learning experiences, college-level learners were asked to provide examples of positive and negative collaborative experiences that have left an impression on them and to identify any factors that contributed to the experience. All mentions were coded and categorized as learner characteristics, group characteristics or instructional characteristics and within each category sorting was done according to activity, interaction, and attributes. Data analysis results were presented in descriptive format using numbers and percentages, narrative, and example experiences.

Positive collaborative experiences and factors. Learner participants that provided comments represented 84.4% ($n=38$) of the 45 survey participants. Of the 104 unique mentions coded for positive experiences and factors, 24% ($n=25$) pertained to learner characteristics, 54.8% ($n=57$) pertained to group characteristics, and 21.1% ($n=22$) pertained to instructional characteristics.

In regard to positive learner characteristics, factors were categorized as level of effort, interaction with others, and individual attributes. Positive learner mentions for level of involvement accounted for 32% ($n=8$) of mentions, interactions with others accounted for 36% ($n=9$) of mentions, and individual attributes accounted for 32% ($n=8$)

of mentions. Table 8 provides a summary of positive learner mentions for learner characteristics.

Table 8

Summary of Positive Learner Mentions for Learner Characteristics

Level of effort	Interactions with others	Individual attributes
Active participation (2)	Clearly communicates (2)	Ethical (1)
Committed (4)	Constructive criticism (1)	Interested (2)
Contributing (2)	Listening (1)	Leadership (1)
	Respectful (2)	Ownership (1)
	Shares experiences (2)	Passion (1)
	Supportive (1)	Responsible (2)

Note. Number in parenthesis is number of unique mentions.

For level of effort, positive factors were reported to be associated with learners' participation, commitment, and contribution to the group activity. This is illustrated in the positive experience shared by Learner Participant 4:

We had a tough group assignment that was almost impossible. But none of us gave up even though directions from the instructor were unclear. We met as a group over 30 times and sometimes we [met] for hours on a Saturday. Good thing was, through our hard work, we unbelievably completed the project and passed the course.

For interactions with others, the responses indicated that it was not only important that the learner communicate clearly with other group members but that the manner in which the learner communicated also mattered. For instance, constructive criticism and

being supportive were factors mentioned as part of a positive experience for Learning Participant 23. Learner Participant 29 acknowledged that when there is respect among team members it means that the group can disagree and still continue to achieve its goal.

For individual attributes, the most common mentions appear to suggest that learners who showed an interest in the project and took responsibility for their actions were positive factors. Learner 6 described a positive experience where participants were all equally motivated and took ownership of the project to make it successful. Responses suggested that individual attributes that supported taking ownership of the activity and outcomes were reflected in behaviors associated with commitment and positive communication.

Regarding positive group characteristics, factors were categorized as level of involvement, interaction among members, and member attributes. Results of coding showed that level of involvement received 33.3% (n=19) of mentions, interaction with others received 42.1% (n=24) of mentions, and individual attributes received 24.6% (n=14) of mentions. Table 9 provides a summary of positive learner mentions for group characteristics.

For level of involvement, mentions described positive factors associated with learner contribution to the group. Mentioned most frequently were the factors of equal contribution, use of skills, and sharing of knowledge. The analysis of responses pointed out that equal contribution among members and a willingness to share expertise and experience with others in the group had a positive effect upon the collaborative group experience. As Learner Participant 24 attested, “[There was a] high level of collaboration within the team. Everyone did their part. I never had to worry about the others because

they consistently met deadlines and obligations.” Becoming collaborative as a group through sharing diverse skills was also the experience of Learner Participant 8, “This work was truly collaborative, each member of the team focused on using their skills, the end product was something we could say was ‘ours and that we were proud of.’”

Table 9

Summary of Positive Learner Mentions for Group Characteristics

Level of involvement	Interactions among members	Member attributes
Equal contribution (4)	Challenge each other (1)	Amiable (4)
Attend meeting (2)	Clear focus (1)	Encouraging (1)
Led own learning (1)	Clear vision (1)	Equality (1)
Join discussions (2)	Common goal (2)	Experience (2)
Work hard (1)	Communicate goals (1)	Mutual interest (1)
Use skills (4)	Communication channels (2)	Openness (3)
Share knowledge (4)	Group expectations (2)	Used strengths (2)
	Group leader (2)	
	Group mediator (1)	
	Plan (1)	
	Project details (2)	
	Rapport (5)	
	Review (1)	
	Role assignment (1)	

Note. Number in parenthesis is number of unique mentions.

For interactions with others, results showed that rapport was most frequently mentioned, and analysis strongly reflected the importance of having good relationships among members. Learner Participant 43 shared how good relationships supported efforts to communicate and share responsibility:

In the last class I took, I think it was a positive experience based on the quality of our final project and based on the personal relationships I developed in the process. I think we all did a very good job dealing with our various demands and stresses. We made efforts to maintain our lines of communication, almost to excess. We did all we could to communicate our needs and divulge our areas of weakness and strength. We did a good job of divvying up the tasks and helping each other along the way.

Rapport affects the collaborative process in many ways. Learner Participant 12 found it to support open communication that facilitated progress reporting and planning. Rapport is also helpful in maintaining a shared understanding and goal. In the experience of Learner Participant 46, even though team members had different responsibilities, by actively communicating everyone was still working towards a common goal.

For member attributes, being amiable and open were often mentioned and further supported the importance of building relationships in the collaborative experience. Learner Participant 28 experienced “being in tune” with the rest of the group, even though they challenged one another, they became friends through the process.

Regarding positive instructional characteristics, factors were categorized as instructor role, interaction with learners, and course attributes. Positive mentions showed that instructor role accounted for 13.6% (n=3) of mentions, interactions with learners

accounted for 31.8% (n=7) of mentions, and course attributes accounted for 54.6% (n=12) of mentions. Table 10 provides a summary of positive learner mentions for instructional characteristics. For instructor role, positive factors mentioned were facilitator, leadership, and support. Learner Participant 15 reported an “incredible collaborative experience” when the instructor served as a facilitator and provided clear guidance and direction to the group.

Table 10

Summary of Positive Learner Mentions for Instructional Characteristics

Instructor role	Interactions with learners	Course attributes
Facilitator (1)	Actively engaged (2)	Authentic (5)
Leadership (1)	Clear expectations (3)	Clearly documented course requirements (2)
Support (1)	Clear feedback (1)	Individual reward (1)
	Supportive (1)	Structure (1)
		Technology tools (3)

Note. Number in parenthesis is number of unique mentions.

For interaction with learners, the instructor being active and providing clear expectations were among the top factors mentioned as affecting positive collaborative group learning experiences. Learner Participant 18 described a positive experience where learners shared their thoughts and ideas with the instructor and were supported by the instructor who “jumped in” to answer questions and help keep the group on task. For course attributes, authentic was the factor most mentioned as having a positive effect on the collaborative experience. An analysis of authentic mentions suggested that real-world

projects are compelling and served to ground the experience in relevance, as affirmed by the experience of Learner Participant 35: “A group of four [learners] working on an evaluation project for the [government agency omitted] - a real world case study for a class. We knew the work was valuable and could really affect other people.”

Negative collaborative experiences and factors. Of the 45 learner participants, 86.6% (n=39) provided comments for negative experiences and factors that produced 95 unique mentions. For all negative responses, 40% (n=38) of mentions were coded for learner characteristics, 41.1% (n=39) were coded for group characteristic, and 18.9% (n=18) were coded for instructional characteristics.

In regard to negative learning characteristics, factors were categorized as level of effort, interaction with others, and individual attributes. Negative learner mentions for level of effort were 36.8% (n=14) of mentions, interactions with others were 31.6% (n=12) of mentions, and individual attributes were 31.6% (n=12) of mentions. A summary of negative learner mentions for learner characteristics appears in Table 11.

Table 11

Summary of Negative Learner Mentions for Learner Characteristics

Level of effort	Interactions with others	Individual attributes
Minimal contribution (4)	Lack of commitment (2)	Dominant personality (3)
Missed meetings (3)	Lack of engagement (2)	Low expectations (2)
Unavailable (1)	Missed deadlines (3)	Poor work ethic (5)
Unwilling to participate (6)	Non-communicative (3)	Unmotivated (2)
	Violation of expectations (2)	

Note. Number in parenthesis is number of unique mentions.

For level of involvement, coded responses identified minimal contribution and an unwillingness to participate on the part of individual learners' as the most frequently mentioned factors that negatively impact the collaborative experience. Learner Participant 42 shared a negative experience from a group project where two group members ended up doing the majority of the work primarily because the other three group members did not attend the meetings on a regular basis and in one case failed to attend any of the meetings. Attending a meeting is not the same as being involved either, as Learner Participant 4 found when several members that infrequently attended meetings did show up but "were usually on Facebook rather than concentrating." Frustration with other members who do not participate was reflected in the comment of Learner Participant 8, who stated "Several group members seemed to drop off the face of the planet when it came time to actually get work done."

For interactions with others, violation of expectations, missed deadlines, and lack of communication were factors mentioned that contributed to negative collaborative experiences. Analyses of responses revealed that negative collaborative experiences were caused by learners that did not engage in group activities or did not fulfill their obligations to the group. A violation of expectations occurred for Learner Participant 24 when group members either did not do the work assigned to them or they did it poorly. Reliance on others in the collaborative process is a trust issue, and Learner Participant 9 reported being "disappointed" in other members' behavior because, when it came time to do the work, several members of the group took on only a few tasks or only wanted to do the easiest tasks. A violation of expectations on the part of some group members may also mean that others in the group are required to do more work. Learner Participant 43

reported that “Some would not complete individual group assignments on time and final tasks for the project were also neglected, leaving me to assemble, clean up and submit the final paper.”

For individual attributes, poor work ethic was the most mentioned negative factor. Learner Participant 38 told of one instance of poor work ethic when the group member was not only late with assignments but “made up information in the final report.” While poor work ethic may produce unacceptable results, a dominant personality was another negative factor reported to have a negative effect on the collaborative experience. Responses indicated that the dominant individual impedes open discussions and hampers shared understanding. In the experience recounted by Learner Participant 22, other group members had their opinions “drowned out” when they did not agree with “a person who was incredibly domineering.” With a dominant personality, it appears that there is an overreaction when faced with the loss of control over the learning situation:

One team member had a differing opinion as to the direction that the rest of the team wanted to take. This team member was a knowledgeable student, but was not open to other ideas. While [this team member’s] idea was not wrong, it was not in the overall interest of the group to pursue. [This team member] fought the team and made it a very “unenjoyable” experience. Even when the team agreed to follow [this team member’s] direction [this team member] would also not allow the other team members to complete their assigned tasks without intervention.

(Learner Participant 46)

Regarding negative group characteristics, factors were categorized as level of involvement, interaction among members, and member attributes. Negative learner

mentions of level of involvement received 30.8% (n=12) of mentions, interaction among members received 51.3% (n=20) of mentions, and member attributes received 17.9% (n=7) of mentions. Table 12 provides a summary of negative learner mentions of group characteristics.

Table 12

Summary of Negative Learner Mentions for Group Characteristics

Level of involvement	Interactions among learners	Member attributes
Coordinate schedules (3)	Bad rapport (1)	Controlling (2)
Hurried effort (1)	Lack of buy-in (1)	Poor leadership (1)
Not willing to engage (1)	Lack of communication (3)	Poor quality (3)
Time consuming (1)	Lack of confidence (1)	Wasted time (1)
Uncertainty of role (1)	Lack of leadership (2)	
Work inequities (5)	No common understanding (2)	
	No discussions (1)	
	No/unclear rules (3)	
	Poor expectations (2)	
	Unclear goal (4)	

Note. Number in parenthesis is number of unique mentions.

For level of involvement, the factors of work inequities and difficulty coordinating schedules were mentioned most frequently. Becoming cohesive as a team requires interaction, and Learner Participant 44 related being frustrated when attempting to organize schedules for a group project because different members had different schedules and when the group was able to meet some members came late or left early.

For interactions among learners, the results of coding found that negative factors were associated with developing group processes and establishing a common understanding. An analysis of responses suggested that when there is a lack of communication, the group is unable to clarify goals, roles, and other group functions and this led to a negative collaborative experience. For instance, Learner Participant 29 explained that when group goals were not well defined, they were subject to change on a “whim” and resulted in the group either wasting time or some group members working against the goals of the project.

Communication facilitates the development of a common understanding of rules and commitments within the group. Without a clear definition of these things, there may be very different expectations among group members about the outcomes and expectations, stated Learner Participant 17. Consider the following experience:

The end result [of the project] was satisfactory, for grade purposes, but I felt there [were] huge disparities in the quality and quantity of the work completed by our individual team members. Perhaps we didn't discuss, clearly enough, what we expected each one of us to do. So there was a lack of communicating issues [and] there were planning issues with regard to setting milestones and responsibilities.

(Learner Participant 43)

A lack of clarity can be upsetting because clearly articulating roles and responsibilities provides guidance for learners and helps them understand expectations. As was the case for Learner Participant 5, who did not understand their role in the group and when they did not fulfill their responsibilities, other group members became upset.

For member attributes, poor quality of work had the most mentions, followed by a controlling member, as negative factors. Learner Participant 33 recounted how poor quality of work affected the collaborative experience: “Some members contributed minimally and with low quality, which created problems for others who depended on the input.” When it comes to controlling members, a negative effect was reported because relationships and interactions within the group are compromised. One experience with a controlling member was that group functions were subverted when the member told everyone what to do, wouldn’t listen to others input, and redid work that other members submitted to the group, shared Learner Participant 34.

With regard to negative instructional characteristics, factors were categorized as instructor role, interaction with learners, and course attributes. Negative learner mentions for instructor role received 38.9% (n=7) of mentions, course attributes received 38.9% (n=7) of mentions, and interactions with learners received 22.2% (n=4) of mentions. Table 13 provides a summary of negative learner mentions for instructional characteristics.

Table 13

Summary of Negative Learner Mentions for Instructional Characteristics

Instructor role	Interactions with learners	Course attributes
Hands-off (2)	Guidelines not clear (2)	Group reward (2)
Instructor inaction (5)	Lack of guidance (1)	Group selection (1)
	Would not discuss (1)	Group size (2)
		Lack of guidelines (2)

Note. Number in parenthesis is number of unique mentions.

For instructor role, mentions of instructor inaction were the most common. Response analysis suggested that when an instructor is aware of a problem but does not take any corrective actions there was a negative effect on the collaborative experience. One experience suggested that this type of inaction undermined the group's ability to reach resolution and function properly:

The most challenging or disappointing experience I ever had in this type of [collaborative] environment came when the instructor was hesitant to engage a member of the group to which I was assigned. It was very clear that this specific member was not engaged in the activities with the group and barely meeting the basic course requirements, let alone those associated with successful group project participation. [As a result a] key number of group members were left carrying the weight for the whole group...not fun and definitely a negative experience (Learner Participant 26).

For interaction with learners, clear guidelines and guidance from the instructor were factors mentioned as negatively affecting the collaborative experience. Learner Participant 15 expressed being extremely frustrated when working on a "huge" class project with no clarity of instruction or guidance. For the project that Learner Participant 33 was involved in, "no guidance was given, leaving the team to figure out how to self organize" and, as a result, there was a belief that nothing was learned and that more could have been accomplished working alone.

For course attributes, reward structure and group formation were reported to have negative effects on the collaborative experience. As expressed by Learner Participant 3: "I hate it when I end up doing most of the work and someone else gets credit for the end

product.” A sentiment shared by Learner Participant 4: “We did most of the work and finished with the two members contributing the least but getting the same grade like the rest of us.”

Summary of responses. Of the 45 learner survey participants, 84.4% ($n=38$) provided responses for positive experiences and factors associated with collaborative group learning, which produced 104 coded mentions. Over half (54.8%, $n=57$) of the positive codes generated fell into the group characteristics category, while the learner characteristic category received 24% ($n=25$) and the instructional characteristics category received 21.1% ($n=22$).

Regarding positive learner characteristics, the positive factors associated with level of effort were a commitment and contribution on the part of the learner to the success of the collaborative activity. For interaction with others, analysis of responses indicated that when learners were able to communicate clearly and considerately with others then relationships were strengthened to the point where group members could disagree and still effectively reach their goal. Individual attributes that were mentioned suggested that a positive effect on the collaborative experience occurred when learners showed an interest in the subject and took responsibility for their actions.

In regard to positive group characteristics, mentions for level of involvement revealed that equal contribution among members and a willingness to share expertise and experience with others in the group had a positive effect upon the collaborative group experience. For interactions with others, the mentions of rapport were the most frequent, and the analysis of responses showed that when relationship building was founded on open communications there was a positive effect on the collaborative process. Rapport

was found to affect the collaborative process in several ways: it supported communication that facilitated progress reporting and planning, and was helpful in maintaining a shared understanding and goal. For individual attributes, being amiable and open were often mentioned responses that further supported the importance of relationship building in the collaborative experience.

With regard to positive instructional characteristic, facilitator, leader, and supporter were mentioned as instructor roles that had a positive effect upon the collaborative experiences. For interaction with learners, response analysis found that instructors that are actively engaged and provide clarity of expectations have a positive influence on the collaborative experience. Mentions for course attributes indicated that authentic experiences are regarded by many learner participants to be a positive factor because real-world projects were seen as more compelling and grounded the activity in relevance. Furthermore, it was reported that a combination of course attributes, such as, course requirements, technology tools, and reward structures were also factors.

Responses for negative experiences and factors were provided by 86.6% (n=39) of the 45 learner participants. The responses generated 95 unique mentions. Learner characteristics accounted for 40% (n=38) of mentions, group characteristics accounted for 41.1% (n=39) of mentions, and instructional characteristics accounted for 18.9% (n=18) of mentions.

Regarding negative learner characteristics, mentions for level of effort suggested that there is a negative effect on the collaborative experience when individual learners were unwilling to participate in the group or only minimally contributed to the group. For interactions with others, mentions included violation of expectations, missed deadlines,

and lack of communication and the analysis revealed that negative collaborative experiences arose when learners did not fulfill their obligations or submitted sub-par work to the group. The implication was that when some group members failed to meet deadlines or turned in poor quality work others in the group were required to do more work to ensure success for the group. For individual attribute mentions, poor work ethic was the most mentioned negative factor; however, a dominant personality also created a negative experience because the personality hampered open discussion and shared understanding.

Regarding negative group characteristics, the most frequently mentioned negative factors for level of involvement were work inequities and scheduling coordination issues. For interactions among learners, response analysis suggested that when there is a lack of communication, the group is unable to clarify goals, roles, and other group functions and this led to a negative collaborative experience because communication facilitates the development of a common understanding of rules and commitments within the group. Communication helps clarify expectations and roles and keeps the group members focused on their responsibilities and provides guidance as the group progresses toward the common goal. For negative member attributes, poor quality of work and presence of a controlling member had the most mentions as negative factors. Responses indicated that a controlling member had a negative effect on the collaborative process because relationships and interactions were subverted and lacked mutual trust and respect.

With regard to negative instructional characteristics, coding results showed that instructor inaction was the most common mention for instructor role. The implication from response analysis was that when an instructor is aware of a problem but does not

take any corrective actions group functions are impaired and the collaborative process is undermined. For interaction with learners, responses suggested that lack of clarity in guidelines and guidance negatively affected the collaborative group learning experiences because it led to confusion over expectations. For course attributes, reward structure and group formation were the most frequently mentioned negative factors, and responses indicated dissatisfaction when one group member contributed less to the success of the group but was awarded equally.

Instructor Survey Results

Response and Data Screening

Of the 58 individuals who responded to the instructor survey, 75.9% ($n=44$) self-selected that they met the criteria for participation in the survey. McMillan (2004) recommends a minimum of 30 subjects for non-experimental correlation research, and descriptive and qualitative studies do not have a recommended minimum. All 44 subjects provided data, but responses were missing for five cases; four of the cases had one missing item, and one case had two missing items. In two cases, the missing items were the same, but the question itself was secondary, and it was decided that these missing cases would not affect analysis. Administering the instrument in an online environment using a browser-based form made data screening much easier because it allowed pre-coded answers to closed-ended questions. Data screening revealed incomplete and inconsistent data for the nationality question; in three cases the participants thought the question was asking for race, and in five cases the question was left blank. This question was deleted from the analysis.

Instructor Demographics

In regard to gender, instructor demographic scores show that there were fewer female participants (43.2%, $n=19$) than male participants (56.8%, $n=25$). Instructor ages ranged from 20 years to over 70 years with the mean score ($M=3.70$, $SD=1.206$) falling in the age range of 50 to 59 years. The 50 to 59 years range also had the most respondents (34.9%, $n=15$) followed by the age range of 60 to 69 (25.6%, $n=11$). A summary of the demographic distributions for the instructor survey is shown in Table L1.

For years of experience as an instructor, over half of the scores were for the 11 or more years range (56.8%, $n=25$), while the 6 to 10 years of experience range accounted for 22.7% ($n=10$) of the remaining scores, and the 1 to 5 years of experience range accounted for 20.5% ($n=9$). The mean score for years of experience as an instructor fell in the 6 to 10 year range ($M = 3.36$, $SD = 8.10$). The mean score for years of experience working as a professional was in the 11 or more years range ($M = 3.77$, $SD=.565$) as reported by 84.1% ($n=37$) of respondents. Scores for years of experience in IDT found that 72.7% ($n=32$) reported having at least 11 years of experience. The mean score also fell in this range ($M = 3.59$, $SD=.726$). For frequency of group work as a professional, the mean score of 4.02 ($SD=.505$) was reflective of the 75% ($n=33$) of respondents scoring in the often range. No scores were recorded for the never or seldom ranges. Table L2 shows the professional experience distributions for instructors.

Instructor Results for Research Question One

Research question one asked: What is the perceived value of collaborative learning groups held by college-level learners and instructors? To investigate the perceived value of collaborative group learning held by college instructors, three value

variables were used: (1) supports learning goals, (2) pedagogical value, and (3) professional benefit. Descriptive statistics for each variable appears in Table M1. Demographic analysis consisted of descriptive statistics, correlational analysis, and between group mean difference tests. A bivariate correlation was used to explore whether relationships existed between any of the value variables or the secondary concern variables (social and group self-efficacy and participation preference).

Descriptive and demographics statistics for value variables. The mean score for supports learning goals was in the agree range at 5.18 ($SD = .786$) with over half of the respondents (54.5%, $n=24$) agreeing that collaborative group learning supports their students' learning goals and another 34.1% ($n=15$) in strong agreement. Only one respondent disagreed at any level. Descriptive statistics, means, and standard deviations for the value variable supports learning goals by demographics are provided in Table M2. The results of multiple regression analysis between supports learning goals as the criterion variable and each of the demographic variables as predictors found no correlations of significance $F(6, 36) = .961, p > .05$ with $R^2 = .138$ and adjusted $R^2 = -.006$ (see Table M3 for summary). Testing for between group differences found no significance between groups for gender, age, years of experience as an instructor, years of experience as a professional, years of experience in field of IDT, and frequency of group work in professional career. (See Table M8 for between group test results for all demographics.)

For pedagogical value, the mean score, 5.14 ($SD = .966$) fell in the agree range. Of the 43 responses, only one participant disagreed at any level, while 41.9% ($n=18$) of the responses agreed and 39.5% ($n=17$) strongly agreed that collaborative group learning

held pedagogical value. Table M4 provides descriptive statistics, means, and standard deviations for pedagogical value by demographics. The results of multiple regression between pedagogical value as the criterion variable and each of the demographic variables as predictors found no correlations of significance $F(6, 35) = .977, p > .05$ with $R^2 = .143$ and adjusted $R^2 = -.003$ (see Table M5 for summary). Testing for between group differences found no significance between groups for gender, age, years of experience as an instructor, years of experience as a professional, years of experience in field of IDT, and frequency of group work in professional career.

The mean score for professional benefit fell in the strongly agree range ($M = 5.64$, $SD = .685$) with 72.7% ($n=32$) of all scores; 20.5% ($n=9$) of scores fell in the agree range. Table M6 shows the descriptive statistics, means, and standard deviations for professional benefit by demographics. The results of multiple regression analysis between professional benefit as the criterion variable and each of the demographic variables as predictors found no correlations of significance $F(5, 37) = .467, p > .05$ with $R^2 = .113$ and adjusted $R^2 = -.007$ (see Table M7 for summary). Testing for between group differences found no significance between groups for gender, age, years of experience as an instructor, years of experience as a professional, years of experience in field of IDT, and frequency of group work in professional career.

Inter-correlations among value variables. Bivariate correlation explored the relationship among five variables; the three value variables and the two secondary concern variables (social and group self-efficacy and participation preference). Table 14 shows a correlation matrix among all five variables. Results revealed a significant, positive correlation between supports learning goals and pedagogical value, $r(43) = .803$,

$p < .001$. The results showed that a significant, positive correlation existed between supports learning goals and professional benefit, $r(44) = .731, p < .001$. A significant, positive correlation also occurred between pedagogical value and professional benefit, $r(43) = .722, p < .001$. Pedagogical value had a significant, positive correlation with participation preference $r(43) = .376, p < .05$. A significant, positive correlation also existed between professional benefit and participation preference $r(44) = .397, p < .001$.

Table 14

Instructor Results: Correlation Matrix for Value Variables

	1	2	3	4	5
1. Supports learning goals	-				
2. Pedagogical value	.803**	-			
3. Professional benefit	.731**	.722**	-		
4. Social and group skills self-efficacy	.263	.079	.042	-	
5. Participation preference	.263	.376*	.397**	.060	-

** $p < .001$ (2-tailed)

* $p < .05$ (2-tailed)

Analysis of responses for value and benefit. Instructor participants were asked to provide additional comments about factors believed to affect the perceived value and benefit of collaborative group learning and 61.4% (n=27) of the 44 instructor participants responded. Value factor themes that emerged from the responses were: (1) learning goals and outcomes as mentioned by 70.4% (n=19) of responses, (2) implementation strategies as mentioned by 48.1% (n=13) of responses, and (3) individual learner attributes as mentioned by 44.4% (n=12) of responses. Words or phrases that typified the theme of

learning goals and outcomes were authentic, professional, and measurement. Mentions of implementation strategy included such words or phrases as theory, context, and instructor role. Individual learner attribute mentions were words or phrases that described learner preferences and attitudes toward collaborative group learning.

An analysis of instructor responses found that preparing learners for professional careers was a primary consideration when deciding to include collaborative group learning activities as part of their instruction. As Instructor Participant 5 acknowledged, “learning how to be a team member is a skill that is useful in many careers.” A view shared by Instructor Participant 9, who declared, “Personally, I don’t feel students would be anywhere near prepared for professional practice without collaborative learning groups. In my view, they are essential for the transfer of learning from the academic to the professional setting.” Taking steps to provide a “professional education” that mimics the real work environment was recommended by Instructor Participant 4, who felt that this was accomplished through the inclusion of realistic tasks and practitioners in the collaborative activity.

Responses indicated that collaborative group learning activities had social and academic benefits. Instructor Participant 14 felt that collaborative activities were particularly well suited to encourage interaction between learners. Interaction helps build social skills, as Instructor Participant 19 indicated, because having to interact in a collaborative environment helped learners put aside personal preferences and work with a wide diversity of personality types. Interaction is beneficial to learning because it exposes learners to a wide range of knowledge and facilitates peer mentoring (Instructor Participant 26). In the experience of Instructor Participant 42, collaboration involved

open discourse and examination of multiple perspectives that tended to promote higher order thinking skills. However, Instructor Participant 23 admitted that collaborative group learning is hard to do well and is difficult to measure in terms of specific gains.

The benefits of collaborative group learning are often juxtaposed with one of its main criticisms, as found in the response of Instructor Participant 2, who warned about learners that take advantage of group work by getting by with less work. Instructor Participant 44 added that the result of such learner actions can not only be that there is less contribution to the group but also that there is less learning taking place. Whatever the reason, Instructor Participant 8 pointed out that there were real learning implications, “When [collaboration] goes wrong, I worry that people take the wrong lessons away from it.” Instructor Participant 36 concurred, “Collaborative learning certainly has its value and benefits but it also has drawbacks because the focus in collaborative learning tends to be more on the process rather than the product or outcome.”

Responses suggested that the value of collaborative group learning can be affected by the implementation strategies invoked relative to the instructional context. Some instructors reportedly included collaborative activities in their instruction on the basis of personal preference (Instructor Participant 6) or a strong constructivist view of learning (Instructor Participant 13). However, other instructors asserted that implementation decisions needed to be driven by the learning context (Instructor Participant 25) and instructional criteria (Instructor Participant 11). Appropriateness is of the utmost concern for Instructor Participant 3, who professed, “The inclusion of collaborative activities should be predicated on the situation, as should the type of activity.”

Another strategic concern that is reported to have an effect on perceived value of collaborative group learning is the role of the instructor. Instructor Participant 35, who found the high level of effort required to coordinate collaborative activities was due to the fact that some students find it challenging to “play well with others”, stressed that “establishing a positive group environment often requires more instructor support than one would expect.” Instructor Participant 26 also found that collaborative activities were difficult to oversee; however, as Instructor Participant 29 emphasized, “If there are weaknesses in how effective the outcomes are, much of that comes back to the instructor, for a variety of reasons.” It was suggested that the instructor could increase group effectiveness by providing structure for collaboration that addressed procedural questions (Instructor Participant 26), providing a mechanism for feedback on group issues (Instructor Participant 39), and encouraging and rewarding full participation (Instructor Participant 42).

Another implication found in responses was that the value of collaborative group learning is affected by individual learner attributes. Instructor Participant 20 mentioned that some learners may not perceive collaborative group learning as a benefit to their learning because they are uncomfortable with this type of activity. One such feeling is associated with losing a level of control over the learning situation:

Not all students like collaborative group learning. The most motivated ones often prefer to work alone, although they realize there [are] benefits to be gained by learning to work in groups. Their concern is that the quality of work from the group will be inferior to that produced by their solitary efforts. (Instructor Participant 21)

Learning preference is not the only challenge for learners in a collaborative environment. In the experience of Instructor Participant 25 some students find collaboration challenging because of issues related to self-regulation and self-efficacy. In any case, Instructor Participant 15 has found that, “My students either love the collaborative learning assignment or they hate it. They feel strongly, either way.”

Summary of results and responses. For supports learning goals, the mean score, 5.18 ($SD = .786$), fell in the agree range. Over half of all scores fell in the agree range (54.5%, $n=24$) and another 34.1% ($n=15$) fell in the strongly agree range. The mean score for pedagogical value fell in the agree range ($M = 5.14$, $SD = .966$) with 81.4% ($n=35$) of the 43 responses agreeing or strongly agreeing that collaborative group learning held pedagogical value. For professional benefit, 72.7% ($n=32$) of all scores were in the strongly agree range, as was the mean score ($M = 5.64$, $SD = .685$). Each of the three value variables had only one respondent score any disagreement, and pedagogical value was the only variable to receive that score in the strongly disagree range. Correlation analysis and testing for differences between group means for demographics did not find any significance for any of the value variables.

Inter-correlations among the three value variables showed a significant, positive correlation among them all. A significant, positive correlation occurred between supports learning goals and pedagogical value ($p < .001$), that indicated that instructor participants more in agreement that collaborative group learning supported their students' learning goals were also more likely to agree that it was an effective method of learning. A significant, positive correlation occurred between supports learning goals and professional benefit ($p < .001$) and suggested that instructor participants that agreed that

collaborative group learning supported their students' learning goals were also more likely to agree that it will benefit their future careers. A significant, positive correlation occurred between pedagogical value and professional benefit ($p < .001$), suggesting that instructor participants were likely to agree that collaborative group learning was both effective as a learning method and would be beneficial to their students' future careers.

A significant, positive correlation also existed between pedagogical value and the secondary concern variable of participation preference ($p < .05$), suggesting that instructors who perceived collaborative group learning as an effective method of learning for students were more likely to be proactive in monitoring and intervening during collaborative group learning activities. There was also a significant, positive correlation found to exist for professional benefit and participation preference ($p < .001$). This finding implied that instructors who perceived collaborative group learning as benefitting their students' future careers were more likely to prefer being proactive during collaborative group activities.

When asked to provide additional comments about factors believed to affect the perceived value and benefit of collaborative group learning, instructor participants gave comments that were themed as learning goals and outcomes, implementation strategies, and individual learner attributes. Analysis of responses found that preparation for professional career was a major driver for inclusion of collaborative group learning activities in instruction because it offers a distinct opportunity for learners to learn how to work in groups in an authentic context. A stated benefit of learning to work collaboratively involved learners being able to interact with others who may have very different personalities, yet still be effective working together to achieve a common goal.

Despite the reported benefits, it was suggested that actual achievement gains associated with collaborative group learning were difficult to measure. The implication was that group processes often get most of the attention, while outcomes measuring individual learning gains tend to be less of a focus.

Responses indicated that implementation strategies can make a difference in the effectiveness, and thereby the perceived value, of the collaborative group learning activity. In some cases, collaborative activities were included in instruction based on personal or theoretical preferences. However, other instructors recommended that a major consideration should be the appropriateness of the collaborative activity in relation to the overall conditions of learning and instructional criteria. Another aspect of strategy that instructors suggested needed to be considered is the level of effort required to facilitate collaboration and the role the instructor takes in the group process. Furthermore, implementation strategies should address the structure and mechanisms of support needed for the group to function effectively.

The benefits of collaborative group learning may not be recognized by some learners because they are uncomfortable with the activity, as implied through instructor participant responses. It was suggested that some learners are apprehensive about losing control of the learning situation because they must rely on others. In other cases, it was individual regulation and skills that posed the challenge to learners in the collaborative process. Whatever the reason, it was reported that it was not uncommon for learners to feel strongly one way or another about collaborative group learning.

Instructor Results for Research Question Two

Research question two asks: What accountability to successful collaborative learning groups do college-level learners and instructors assign each other? Four variables investigated the perceived expectations of accountability for success in collaborative group learning held by college instructors: (1) leave students alone, (2) active instructor, (3) group process accountability, and (4) learning process accountability. Descriptive statistics for each of the four instructor role variables appear in Table N1. Demographic analysis consisted of descriptive statistics, correlational analysis, and between group mean difference tests. A bivariate correlation was used to explore whether relationships existed among the four instructor role variables along with the two secondary concern variables (social and group self-efficacy and participation preference).

Descriptive and demographic statistics for instructor role variables. The scores for leave students alone showed that the largest percentage of responses (34.1%, n=15) fell in the slightly agree range, followed by the agree range (22.7%, n=10) and disagree range (22.7%, n=10). The mean score was in the slightly agree range ($M = 3.84$, $SD=1.180$). Table N2 provides descriptive statistics, means, and standard deviations for leave students alone stratified by demographics. The results of multiple regression between leave students alone as the criterion variable and each of the demographic variables as predictors found no correlations of significance $F(6, 36) = .726$, $p > .05$ with $R^2 = .108$ and adjusted $R^2 = -.041$ (see Table N3 for summary). Testing for between group differences found no significance between groups for gender, age, years of experience as an instructor, years of experience as a professional, years of experience in

field of IDT, and frequency of group work in professional career. (See Table N10 for between group test results for all demographics.)

The mean score for active instructor was in the slightly agree range ($M = 4.34$, $SD = .987$) with 81.8% ($n=36$) in some form of agreement that instructors should play an active role in collaborative group learning. Table N4 provides a summary of descriptive statistics, means, and standard deviations for active instructors stratified by demographics. The results of multiple regression between active instructors as the criterion variable and each of the demographic variables as predictors found no correlations of significance $F(6, 36) = .480$, $p > .05$ with $R^2 = .074$ and adjusted $R^2 = -.080$ (see Table N5 for summary). Testing for between group differences found a significant difference between group means for active instructor and years of experience as an instructor, $F(2, 41) = 3.475$, $p < .05$. Tukey's multiple comparison found that the 1 to 5 years of experience group ($M=3.70$) was significantly different from the 11 or more years of experience group ($M=4.78$). This result indicated that instructors with 11 or more years of experience perceived that instructors should be more active in group learning activities than did instructors with five or less years of instructional experience. Further testing for between group differences found no significance for gender, age, years of experience as a professional, years of experience in field of IDT, and frequency of group work in professional career.

Though the mean score for group process accountability ($M=3.45$, $SD=.697$) fell in the responsibility range of 50% instructor and 50% students, as did 45.5% ($n=20$) of the scores, the largest percentage of responses was given to the responsibility range of 25% instructor and 75% student (47.7%, $n= 21$). The 100% instructor responsibility

range had one response, as did the 100% students' responsibility range. Table N6 provides descriptive statistics, means, and standard deviations for group process accountability by demographics. Multiple regression results found no correlations of significance $F(6, 36) = .890, p > .05$ with $R^2 = .129$ and adjusted $R^2 = -.016$ between the instructor role of group process accountability as the criterion variable and each of the demographic variables as predictors (see Table N7 for summary). Testing for between group differences found no significance between groups for gender, age, years of experience as an instructor, years of experience as a professional, years of experience in field of IDT, and frequency of group work in professional career.

For learning process accountability, a little over half of the scores (54.5%, $n=24$) fell in the responsibility range of 75% instructor and 25% students, which was also the range for the mean score of 2.27 ($SD = .727$). Another 29.5% ($n=13$) of scores fell in the 50% instructor and 50% students range of responsibility, and 11.4% ($n=5$) fell in the 100% instructor responsibility range. Table N8 provides descriptive statistics, means, and standard deviations for group learning accountability stratified by demographics. The results of multiple regression to find if relationships existed between the instructor role variable of group process accountability as the criterion variable and each of the demographic variables as predictors found no correlations of significance $F(6, 36) = 2.180, p > .05$ with $R^2 = .267$ and adjusted $R^2 = .144$ (see Table N9 for summary). There was no significance found between group means for gender, age, years of experience as an instructor, years of experience as a professional, and years of experience in field of IDT. However, one-way ANOVA testing for between group mean differences did find significance for frequency of group work in professional career, $F(2, 41) = 4.875, p < .05$.

Tukey post hoc testing indicated that when it came to ensuring that the learning process is supported, the always group was more likely to assign more responsibility to the instructor than the often group.

Inter-correlations among instructor role variables. Bivariate correlation explored the relationship among the four instructor role variables and the two secondary concern variables (social and group self-efficacy and participation preference). Table 15 is a correlation matrix consisting of the Pearson's r correlation for all six variables. The results found significant, negative correlations for active instructor and leave students alone, $r(44) = -.392, p < .001$, and for active instructor and group process accountability, $r(44) = -.366, p < .001$. Significant, positive correlations occurred for: (a) leave students alone and group process accountability, $r(44) = .316, p < .05$, (b) leave students alone and learning process accountability, $r(44) = .323, p < .05$, and (c) group process accountability and learning process accountability, $r(44) = -.438, p < .05$. In addition, a significant, positive correlation occurred between active instructor and participation preference, $r(44) = .321, p < .05$.

Analysis of responses for instructor role. Instructor participants were asked to identify what role(s) the instructor should play in collaborative group learning activities. From the 86.4% ($n=38$) of instructor participants that responded, four themes emerged describing functions and activities of the instructor: (1) model oriented, (2) process oriented, (3) structure oriented, and (4) support oriented. Model oriented accounted for 71.1% ($n=27$) of mentions using words or phrases such as example, guide, or professional. Process oriented accounted for 68.4% ($n=26$) of mentions and contained words or phrases such as feedback, intervene, and monitor. Structure oriented accounted

for 71.1% ($n=27$) of mentions and included words or phrases such as framework, expectations, and requirements. Words or phrases such as facilitate, clarify, and resources were used to describe support oriented that accounted for 92.1% ($n=35$) of mentions.

Table 15

Instructor Results: Correlation Matrix for Instructor Role Variables

	1	2	3	4	5	6
1. Leave students alone	-					
2. Active instructor	-.392**	-				
3. Group process accountability	.316*	-.366*	-			
4. Learning process accountability	.323*	-.197	.438*	-		
5. Social and group skills self-efficacy	.022	.186	-.093	.010	-	
6. Participation preference	-.277	.321*	-.170	-.125	.060	-

** $p < .001$ (2-tailed)

* $p < .05$ (2-tailed)

From the analysis of responses it was found that modeling and guiding were suggested roles for instructors. One aspect of the instructor role was to prepare the learner for the activity by explaining and modeling processes, practices, and discussions, indicated Instructor Participant 11. Preparing the learning for collaboration involves setting the stage with cognitive and experiential examples suggested Instructor Participant 29. In agreement is Instructor Participant 35, who provides best practice examples for his/her students: “Using my background as a project management professional, I provide my students with written tips and templates for every step of the project, from team formation through project scope, scheduling, and resourcing.”

Modeling can also be extended to mimic professional roles. Instructor Participant 44 suggested acting as a pseudo-client, project director, or consultant during the collaborative activity. This gives the learner contextual insight that may elude them otherwise:

The instructor should play the role of an expert because even with adult learners, important concepts and understandings can be misunderstood in the hands of novices. Expert thinking needs to be modeled with students and especially with teachers who must model expert thinking for their own students but rarely understand this responsibility (Instructor Participant 44).

In support of modeling as the instructor role, Instructor Participant 19 mentioned that the primary purpose for sharing effective practices was to provide the learner with strategies to use to for problem solving and dealing constructively with issues that arise during the collaborative activity.

A number of responses indicated that the focus of the instructor in collaborative learning activity should be on the process and ensuring that the group functions effectively together. Instructor Participant 21 recognized that involvement can be minimal for well functioning teams, but went on to add, “Monitoring is necessary to detect problems that destroy group cohesiveness and problem resolution.” Monitoring means observing group interactions and proactively addressing any issues that arise, claimed Instructor Participant 17. It was suggested by Instructor Participant 2 that the instructor should meet with groups and check progress, get feedback, and advise, while being careful not to micromanage.

In the process oriented approach, responses indicate that instructors believe there is too much at stake to not be actively engaged. Instructor Participant 19 found that being approachable invites groups to report problems more readily, whereby a more timely resolution can be found. In the view of Instructor Participant 11, being more involved with a group that is off task is an opportunity to help students understand and see what is expected. After all, according to Instructor Participant 16, ensuring that course objectives are met is a responsibility of the instructor: “In some cases this requires more ‘hands-on’ by the instructor and in others, less so. The instructor must continually monitor the group work to ensure the students are learning and will gain the desired knowledge.”

Responses also indicated that the role of the instructor should be to provide the necessary structure for effective collaborative group learning activities. Instructor Participant 35 recommended that a structured approach should include a common framework that “establish[es] the ground rules [and] clearly articulate[s] end-product expectations.” In the experience of Instructor Participant 8, in order for learners to take responsibility for their own actions the instructor must first structure the learning environment with goals, support, problem-framing, and expectations. Instructor Participant 4 explained how this works:

As an instructor, my responsibility is to ensure the environment supports student completion of the project. This means setting standards about teams and the workplace. It means providing mechanisms for teams to reflect on their work and create feedback they will use to shape their efforts. It means providing tools for providing feedback to their teammates, team charters, and ways to identify and mitigate project risks.

The emphasis should be on a strong foundation where the learner is clear about learning outcomes and has the structural and technological tools to achieve the outcome; that is, as long as they take ownership of the activity, suggested Instructor Participant 3. Structure should accommodate assistance (without interference), feedback, and an equitable grading system claimed Instructor Participant 26. Regarding structure, Instructor Participant 12 declared, “If it is set up appropriately, collaborative group learning will almost run itself.”

Support and facilitation of the collaborative process was suggested as the role of the instructor in a number of responses. Instructor Participant 17 suggested that the instructor role should be a resource provider of “information, tools (job aids), and other tangible performance supports.” In particular for the support oriented, responses suggested that groups should be left alone to work out their own issues. This seems to be what Instructor Participant 40 is supporting: “Part of the group experience is for students to learn how to resolve issues, only when they are unable to do so should they contact the instructor.” Instructor Participant 10 clarified that this is not abandoning the learner but rather allowing them to find their own way, until such time as they need support. Instructor Participant 42 provided explanation on how instructors should facilitate learners taking responsibility for their own learning:

The instructor should be a facilitator, meaning a resource the group can come to in order to seek some clarification or request help when stuck. The group should not be made to feel they are completely on their own without any support whatsoever, but the instructor should by no means be the focus of the group. It is

the group's responsibility to make decisions and drive the process, but the instructor should be available to provide support when necessary.

Summary of results and responses. The mean score for leave students alone was in the slightly agree range at 3.84 ($SD = 1.180$); 63.6% ($n=28$) agreed on some level that students should be left alone to work out group issues, 34.1% ($n=15$) disagreed, and one respondent (2.3%) strongly disagreed. Scores for active instructor showed that 81.8% ($n=36$) were in some form of agreement that instructors should play an active role in collaborative group learning. The mean score ($M = 4.34$, $SD = .987$) fell in the slightly agree range. In regard to group process accountability, the mean score ($M=3.45$, $SD=.697$) was in the 50% instructor and 50% students responsibility range. Though this responsibility range scored 45.5% ($n=20$) of responses, the responsibility range of 25% instructor and 75% student received the most responses at 47.7% ($n= 21$). Of the scores for learning process accountability, 54.5% ($n=24$) fell in the 75% instructor and 25% students responsibility range, 29.5% ($n=13$) fell in the 50% instructor and 50% students responsibility range, and 11.4% ($n=5$) fell in the 100% instructor responsibility range. The mean score was in the 75% instructor and 25% students responsibility range ($M = 2.27$, $SD = .727$).

Separate multiple regression analysis for each of the instructor role variables as the criterion variable and demographics as predictor variables found no significant relationships. Between group tests for group mean differences found only one instance of significance. Using one-way ANOVA, a significance difference was found for learning group accountability and frequency of group work in professional career, $F(2, 41) = 4.875$, $p<.05$. Tukey's multiple comparison found a significant difference between the

always group and the often group. The results indicated that instructors with a higher frequency of group work as a professional were more likely to assign the instructor more responsibility for the learning process. No other significance was found for the instructor role variables and demographics or professional experience.

The results of the bivariate correlation among the instructor role variables found a significant, negative correlation for active instructor and leave students alone ($p < .001$). This result indicated that instructors who believed that students should be left alone to resolve group issues also believed that the instructor should not play an active role in collaborative group learning activities. Active instructor and group process accountability also had a significant, negative correlation ($p < .001$). This association suggested that instructorrespondents who believed instructors should play an active role in collaborative group activities were more likely to assign instructors greater responsibility to ensure that a group works effectively.

The bivariate correlation results found a significant, positive correlation for leave students alone and group process accountability ($p < .05$) as well as for leave students alone and learning process accountability ($p < .05$). The first association indicated that instructors who believed students should be left alone to resolve group issues assigned students greater responsibility to ensure that a group works effectively. Similarly, the association between leave students alone and learning process accountability implied that instructors who believed that students should be left alone to resolve group issues were more likely to assign more of the responsibility for ensuring that the learning process is supported to the learner. A significant, positive correlation was found for group process accountability and learning process accountability ($p < .05$). This result implied that

instructors who assign students more responsibility for resolving group issues are more likely to also assign students more responsibility for ensuring that the learning process is supported. A significant, positive correlation was found for active instructor and participation preference ($p < .05$), indicating that instructors who preferred to be more proactive also believed that instructors should play an active role in collaborative group activities.

When identifying the role(s) the instructor should play in collaborative group learning activities, instructor participants identified four orientation themes for instructor functions: (1) model oriented, (2) process oriented, (3) structure oriented, and (4) support oriented. Model oriented comments portrayed the instructor as a provider of best practice models, examples, and resources. Instructors might even model expert thinking, and thereby help learners become aware of strategies for successfully handling issues. Process oriented instructor functions were directed at ensuring effective group work. Primarily this was reported to involve monitoring the group to be aware of issues that may impede the group from making progress. Monitoring can involve observations, progress checks, and feedback loops. Responses suggested that the instructor needed to be careful not to become too involved, while still being approachable about concerns in an effort to address them before they become insurmountable. Being engaged at this level can also provide an opportunity to model expectations and appraise the level of learning.

In structure oriented approaches, the instructor should provide a framework of objectives, guidelines, tools, and expectations for the collaborative activity. Responses indicated that creating an environment that supported the learning process would allow learners to take more responsibility of the own learning. Important to providing structure

for effective collaboration were mechanisms for assistance, feedback, and evaluation. A foundation of clear expectations along with appropriate academic and technical tools would provide a structure that gives learners the confidence to succeed on their own. In the support orientation, the instructor was primarily viewed as a facilitator of the learning process who would provide resources and other necessary supports, while leaving the group to learn to work things out for themselves. The instructor would be available to assist with information, tools, and resources but the emphasis was on the group driving the process and learning how to resolve issues on their own. Too much instructor involvement would build a dependency on the instructor and thus hinder the team from becoming successful on their own terms.

Instructor Results for Research Question Three

Research question three is: What factors do college-level learners and instructors believe contribute to successful collaborative group learning? For factors that contribute to collaborative group learning experiences, college instructors were asked to provide examples of positive and negative collaborative experiences that have left an impression on them and to identify any factors that contributed to the experience. All mentions were coded and categorized as learner characteristics, group characteristics or instructional characteristics and within each category sorting was done according to activity, interaction, and attributes. Data analysis results were presented in descriptive format using numbers and percentages, narrative format, and example experiences.

Positive collaborative experiences and factors. Of the 44 instructor participants, 77.3% ($n=34$) provided responses regarding positive experiences and contributing factors of collaborative group learning that generated 85 unique mentions. Mentions pertaining

to learner characteristics accounted for 23.5% ($n=20$) of mentions, group characteristics accounted for 51.8% ($n=44$) of mentions, and instructional characteristics accounted for 24.7% ($n=21$) of mentions.

In regard to positive learner characteristics, factors were categorized as level of effort, interaction with others, and individual attributes. Positive instructor mentions for level of effort were 15% ($n=3$) of mentions, interaction with others were 15% ($n=3$) of mentions, and individual attributes were 70% ($n=14$) of mentions. A summary of positive instructor mentions for learner characteristics appears in Table 16.

Table 16

Summary of Positive Instructor Mentions for Learner Characteristics

Level of effort	Interactions with others	Individual attributes
Attended meetings (1)	Gave constructive	Adaptive (1)
Used skills (1)	responses (1)	Dedicated (1)
Worked hard (1)	Communicated clearly (1)	Desired to improve (1)
	Shared ideas (1)	Diverse experiences (2)
		Experienced collaborator (1)
		Independent learner (1)
		Interested in subject (3)
		Mature (1)
		Passionate about learning (1)
		Compelled by experience (2)

Note. Number in parenthesis is number of unique mentions.

For level of effort, mentions that described learners' willingness to attend meetings, use their skills, and work hard were positive factors reported to affect the collaborative experience. For interaction with others, clear communication and sharing of ideas were mentioned as having a positive effect on the collaborative process. In the experience of Instructor Participant 27, groups succeeded because the members communicated regularly and responded constructively to one another. Constructive communication can involve sharing knowledge and experiences to provide a different point of view. Instructor Participant 1 found sharing created a very effective learning experience because "students who maybe do not think of themselves as academically inclined as others can share valuable insights in the group and the other students can gain from those insights."

For individual attributes, there were a number of factors mentioned that contributed to positive collaborative experiences; however, learners that had an interest in the subject or found the experience to be compelling were among the most mentioned. Instructor Participant 20 told how a compelling experience brought one group together: "The students in that class were especially dedicated to doing something that would have meaning [and] they were very independent learners. Not all classes have this characteristic." The implication from response analysis was that a passion for what was being learned, and learning in general, created a positive collaborative experience. This appears to be what Instructor Participant 42 is referring to when reporting that some groups just "click" from the beginning. Additional learner attributes that contributed to a positive collaborative experience were reported to be dedication, independence, and a desire to improve. Instructor Participant 16 reported that learners are more likely to have

a positive collaborative experience when they seek to improve themselves, are open to trying new ways of solving problems, and are willing to learn from others with more experience.

Regarding positive group characteristics, factors were categorized as level of involvement, interaction among members, and member attributes. Positive instructor mentions for level of involvement accounted for 2.3% ($n=1$) of mentions, interactions with others accounted for 86.4% ($n=38$) of mentions, and member attributes accounted for 11.4% ($n=5$) of mentions. Table 17 provides a summary of positive learner mentions for group characteristics. The only mention for level of involvement was equal contribution.

For interactions among learners, the most frequently mentioned factors were peer mentoring and resolving issues. The analysis of responses indicated that factors positively affecting the collaborative experience related to developing good relations among members that encouraged shared responsibility and understanding. Responses suggested that sharing responsibility was more than just assigning roles and work. Instructor Participant 21 believed that positive experiences occurred when learners were forced to change roles during or between projects because it gave learners an appreciation for the differing role functions.

Table 17

Summary of Positive Instructor Mentions for Group Characteristics

Level of involvement	Interactions among learners	Member attributes
Equal contribution (1)	Became cohesive (3)	Diverse views (2)
	Communicated (3)	Friends (1)
	Engaged intellectually (3)	Stayed focused (1)
	Equal voice (1)	Took risks (1)
	Open discussions (3)	
	Peer mentoring (5)	
	Relationship building (2)	
	Shared goal (1)	
	Shared responsibility (3)	
	Shared understanding (3)	
	Resolved issues (5)	
	Sought guidance (3)	
	Worked together before (3)	

Note. Number in parenthesis is number of unique mentions.

For member attributes, bringing diverse views to the group was mentioned most frequently. Instructor Participant 37 reported that “Students comment that working collaboratively with other students has allowed them to benefit from each others’ experience as well as to get to know each other within the class.” Other positive factors that were mentioned were friendships, ability to stay focused, and willingness to take risks. Instructor Participant 4 commented that in one case, familiarity between group

members allowed them to quickly become cohesive and stay focused on “working the problem” instead of spending a lot of time on group formation processes.

With regard to positive instructional characteristics, factors were categorized as instructor role, interaction with learners, and course attributes. Mentions coded for instructor role were 14.3% ($n=3$) of mentions, interactions with learners were 14.3% ($n=3$) of mentions, and course attributes were 71.4% ($n=15$) of mentions. A summary of positive learner mentions for learner characteristics appears in Table 18.

Table 18

Summary of Positive Learner Mentions for Instructional Characteristics

Instructor role	Interactions with learners	Course attributes
Guidance (1)	Approachable (1)	Authentic (7)
Modeling (1)	Clear explanations (1)	Clearly stated goals (1)
Monitoring (1)	Encouraging (1)	Feedback loop (1)
		Flexible assessment (1)
		Freedom to be creative (1)
		In class practice (1)
		Learner led (1)
		Reflection time (1)
		Technology (1)

Note. Number in parenthesis is number of unique mentions.

Mentions of guidance, modeling, and monitoring for the instructor role were given as positive factors affecting collaborative experiences. Students that responded to guidance had a more positive experience, claimed Instructor Participant 17. An analysis

of responses indicated that when instructors provided direction, but allowed students make their own decisions, there was a positive collaborative experience because the students effectively took ownership of the process.

For interaction with learners, mentions included the instructor being approachable, providing clear explanations, and giving encouragement as positive factors. Instructor Participant 17 observed that teams who worked well together were more open and honest about personal interests and motives and this enabled them to establish a common goal.

For course attributes, authentic course context was the most frequently mentioned factor that positively affected the collaborative experience. It was found by Instructor Participant 24 that groups work together when they are recommending ways to solve real problems. Providing an authentic activity was the key to a positive collaborative experience, recalled Instructor Participant 44, because it allowed learners to focus on a “real project” and use the diverse experiences of the group to drive the solution. In addition, other positive factors that were mentioned included freedom to be creative, flexible assessments, and clear course goals. Instructor Participant 30 claimed that positive experiences occur by “giving groups freedom to modify existing lessons to meet needs (relevant to the needs of the learners)” but then pointed out that “giving students in these groups some freedom provides unpredictable outcomes - you have to take a risk and not establish too ‘tight’ an assessment plan.” Students exceeded expectations for Instructor Participant 6 when they were allowed creative freedom, established good rapport between themselves and the instructor, and were able to use engaging technologies.

Negative collaborative experiences and factors. For the 44 instructor survey participants, 77.3% (n=34) provided responses regarding negative experiences and factors associated with collaborative group learning. There were 71 unique mentions generated from these responses. The results of coding found that 39.4% (n=28) of mentions were for learner characteristics, 52.1% (n=37) were for group characteristic, and 8.5% (n=6) were for instructional characteristics.

In regard to negative learning characteristics, factors were categorized as level of effort, interaction with others, and individual attributes. Negative instructor mentions for level of effort accounted for 35.7% (n=10) of mentions, interactions with others accounted for 14.3% (n=4) of mentions, and individual attributes accounted for 50% (n=14) of mentions. A summary of negative instructor mentions for learner characteristics appears in Table 19.

For level of effort, the most mentioned negative factors were for minimum effort and no participation. Instructor Participant 30 found that negative experiences were primarily due to members in the group not putting forth equal effort. One implication taken from responses is that minimum effort can result in improper academic behavior, as described by Instructor Participant 27, who reported that when one group was pressured for time they “recycled” work from a previous course as their group project.

For interaction with others, lack of respect and responsibility were mentioned as negative factors. Analysis of responses found that when group members do not treat each other with respect, it evokes negative feelings and affects the collaborative experience. Instructor Participant 8 has had cases where one member of the group regarded

themselves more highly than others in the group, and found this scenario to be a common factor with all of the collaborative “train wrecks” they have witnessed.

Table 19

Summary of Negative Instructor Mentions for Learner Characteristics

Level of effort	Interactions with others	Individual attributes
Minimum effort (4)	Lack of respect (1)	Dependent learners (1)
Missed meetings (1)	Lack of responsibility (1)	Dominant personality (3)
No participation (3)	New student (1)	Individual abilities (3)
Stopped working (1)	Unable to contact (1)	Learning styles (2)
Time constraints (1)		Interested in subject (1)
		Loss of motivation (1)
		Maturity (1)
		Personal expectations (1)
		Poor work ethic (1)

Note. Number in parenthesis is number of unique mentions.

For individual attributes, a dominant personality was mentioned most frequently as a negative factor affecting collaborative experiences. Take, for example, the following account told by Instructor Participant 10 in which a dominant personality clearly had a negative impact: “One student dominated all discussions, though [his/her] ideas were not the best. The others felt their contributions were not valued and stopped working. The project never finished.” Other individual attributes mentioned as negative factors included individual abilities, styles, and expectations. Response analysis suggested that when individual differences were not resolved, the group was unable to function

effectively. The negative effects of personality conflicts occurred when some members of the group ceased to participate fully or instigated a power struggle among members that created “negative dynamics,” observed Instructor Participant 8.

Negative collaborative experiences were reported to have a profound effect on some learners’ attitudes toward the learning method and the academic area. Instructor Participant 31 stated that there have been a few students that were so distraught with group work that they indicated afterwards that “instructional design and technology work was not for them if team projects were a norm for the workplace.” Another instance was remembered by Instructor Participant 36, when one individual was so “emotionally impacted by the team’s overall performance” that the learner considered removing himself/herself from the program altogether.

Regarding negative group characteristics, factors were categorized as level of involvement, interaction among members, and member attributes. Negative instructor mentions for level of involvement accounted for 27% ($n=10$) of mentions, interaction among learners accounted for 64.9% ($n=24$) of mentions, and member attributes accounted for 8.1% ($n=3$) of mentions. Table 20 provides a summary of negative instructor mentions for group characteristics.

For level of involvement, the most frequently mentioned negative factor was labor disparity. According to Instructor Participant 44, learners have lamented that group work was undesirable because certain learners ended up doing all of the work. Similarly, Instructor Participant 20 recounted an experience where only a few learners were engaged in doing the work while others did very little, and pondered if such situations may be caused by having a high number of “dependent” learners in the class.

Table 20

Summary of Negative Instructor Mentions for Group Characteristics

Level of involvement	Interactions among learners	Member attributes
Labor disparities (8)	Did not seek guidance (1)	Contributions not valued (1)
Missed deadlines (1)	Differing expectations (2)	Cross-cultural factors (1)
No contact (1)	Group process stalled (3)	Took on too much (1)
	No common goal (3)	
	No constructive dialog (1)	
	No shared responsibility (2)	
	Limited interaction (2)	
	Politics (1)	
	Poor communication (2)	
	Too social (2)	
	Unaware of situation (2)	
	Unresponsive to guidance (3)	

Note. Number in parenthesis is number of unique mentions.

For interaction among learners, the most frequently mentioned factors negatively affecting the collaborative experience were stalled group processes and lack of a common goal. These factors, as well as mentions of differing expectations, no constructive dialogue, and lack of awareness, were connected to the mentions of poor communication. The analysis of responses suggested that when learners are unable to communicate effectively to agree on direction or settle group issues, the collaborative process was hindered and resulted in a negative collaborative experience. A lack of interaction was a

reason that groups did not work well together because, without establishing responsibility for task and group activities, collaboration did not happen, claimed Instructor Participant

33. The following experience supports this claim:

A group missed a couple of assignment deadlines and group members, individually, expressed unhappiness with the way the group was working. However, group members did little to discuss the problem in a constructive way. The basic problem was that this continued to be a collection of individuals rather than a collaborative group. There was little sense of reciprocal responsibility and limited constructive dialog. Even with instructor guidance, the problems continued with little change. (Instructor Participant 17)

Responses also revealed that unproductive communication can take a highly social form. “A lack of conflict doesn’t mean success,” declared Instructor Participant 4. An example reported by Instructor Participant 9 occurred when one group with a lot in common became more of a “social club than an outcome driven team” and, as time passed, the group missed deadlines and became unresponsive to the situation and the guidance provided by the instructor.

For member attributes, member contributions not being valued and cross-cultural factors were mentioned as affecting the collaborative experience negatively. Analysis of responses indicated that negative collaborative experiences occurred when individuals within the group had differing levels of ability and some felt that their contribution was not appreciated by other members of the team. Additionally, Instructor Participant 39 found that cross-cultural factors had the potential for creating negative experiences when members were not able to relate to one another or value the diversity within the team.

With regard to negative instructional characteristics, factors were categorized as instructor role, interaction with learners, and course attributes. The coding results for instructional characteristics showed instructor role with 16.7% ($n=1$) of mentions and course attributes with 83.3% ($n=5$) of mentions. There were no mentions for interactions with learners. Table 21 provides a summary of negative instructor mentions for instructional characteristics. A mention of lack of instruction was given for instructor role. In the case of Instructor Participant 6, the negative experience occurred when a group delegated all of the responsibility for using a technology tool to one learner merely because that learner was proficient with the tool. In hindsight, the instructor pondered if “perhaps the lack of direct instruction in how to use the tool left many students feeling unsure of their abilities.”

Table 21

Summary of Negative Instructor Mentions for Instructional Characteristics

Instructor role	Interactions with learners	Course attributes
Lack of instruction (1)	No mentions coded	Group reward (3)
		Large group (1)
		Peer evaluations (2)

Note. Number in parenthesis is number of unique mentions.

For course attributes, group reward and peer evaluations were mentioned as negative factors affecting collaborative group experiences. “The biggest drawback to group efforts is how to grade them,” said Instructor Participant 16, and admitted that there is too much subjectivity involved when assigning individual and group grades. Instructor Participant 18 reported that most negative factors were disputes over credit and

responsibility. There was also an indication from the analysis of responses that some students' fear that their grade will be overly affected by peer evaluations.

Summary of responses. For the 44 instructor participants, 77.3% ($n=34$) provided responses related to positive experiences and contributing factors of collaborative group learning that produced 85 unique mentions. Learner characteristics accounted for 23.5% ($n=20$) of mentions, group characteristics accounted for 51.8% ($n=44$) of mentions, and instructional characteristics accounted for 24.7% ($n=21$) of mentions.

In regard to positive learner characteristic mentions, positive factors affecting the collaborative experience for level of effort mentions included descriptions of the learners' willingness to attend meetings, use their skills, and work hard. Clear communication and sharing of ideas was mentioned for interaction with others as positively affecting the collaborative process. Among the most mentioned factors for individual attributes that contributed to positive collaborative experiences were that learners had an interest in the subject or found the experience to be compelling. Additional learner attribute mentions were dedication, independence, and a desire to improve. The implication from response analysis was that a passion for learning the subject matter engaged the learner and was a catalyst for building relationships that helped create a positive collaborative experience.

For mentions of group characteristics, the only mention for level of involvement was equal contribution. For interactions among learners, the most frequent mentions were peer mentoring and resolving issues as factors that positively impacted the collaborative experience. Other positive factors mentioned were developing good relations among members, sharing responsibility, and the development of common understandings. An analysis of responses suggested that open and honest communication supports the

development and maintenance of group processes and functions. Group cohesion was also mentioned as a positive factor. Response analysis indicated that becoming cohesive required communication and shared understanding, and that a consequence of group members having worked together previously is that they may begin to function as a group more quickly and more collaboratively than otherwise. For member attributes, the most frequent positive factor mentioned was that learners brought diverse views to the group; however, friendships, ability to stay focused, and willingness to take risks were also mentioned.

Regarding instructional characteristics, positive factors mentioned for instructor role were guidance, modeling, and monitoring. An analysis of responses indicated that when instructors provided direction, but allowed students to make their own decisions, there was a positive collaborative experience because the students effectively took ownership of the process. For interaction with learners, positive factors that were mentioned included the instructor being approachable, providing clear explanations, and giving encouragement. An authentic course context was the most frequently mentioned factor for course attributes that positively affected the collaborative experience, but also included mentions of freedom to be creative, flexible assessment, and clear course goals.

With regard to negative factors, of the 44 instructor survey participants, 77.3% ($n=34$) provided responses for negative experiences and factors that generated 71 unique mentions. The results of coding found that 39.4% ($n=28$) of mentions were for learner characteristics, 52.1% ($n=37$) were for group characteristic, and 8.5% ($n=6$) were for instructional characteristics. Regarding negative learner characteristics, the most mentioned negative factors concerned learners giving only a minimum level of effort or

learners not participating at all. An implication taken from responses is that minimum effort can result in improper academic behavior. For interaction with others, the mentions of negative factors included a lack of respect, responsibility, and contact and analysis found that when group members do not treat each other with respect, it evokes negative feelings and affects the collaborative experience. For individual attributes, dominant personality was among the most frequently mentioned, while other negative factors included individual abilities, learning styles, and expectations. Response analysis suggested that when individual differences were not resolved, the group was unable to function effectively.

With regard to group characteristics, labor disparity was the most frequently mentioned negative factor for level of involvement. For interaction among learners, an analysis of responses indicated that the mention of poor communication was related to a number of other negative factors mentioned, such as stalled group processes, lack of a common goal, differing expectations, and no constructive dialogue. The analysis suggested that the collaborative process is hindered when learners are unable to communicate effectively to agree on direction or settle group issues, thereby resulting in a negative collaborative experience. Unproductive communication was also reported to occur when a team becomes highly social and does not perform. Furthermore, it was mentioned that negative experiences occurred when groups did not follow guidance when it was provided to them by the instructor. Mentions for member attributes show that contributions not being valued and cross-cultural issues were negative factors that were reported to affect the collaborative experience.

Regarding instructional characteristics, mentions for instructor role showed that a lack of instruction contributed to negative collaborative experiences because learners were not adequately prepared for the activity. There were no negative mentions for interactions with learners. For course attributes, mentions of group reward strongly indicated that learners wanted to be rewarded individually for their contributions, especially if other members did not contribute equally. Peer evaluations were also mentioned as a negative factor, and it was suggested that some learners' fear that their grade will be overly affected by peer evaluations based on having to get assistance from others in the group or the strength of the relationship they had with other group members.

Chapter 5: Discussion

The purpose of this study was to discover how college students and instructors perceive collaborative group work within a learning context, including: (a) the value that each constituency places upon collaborative group activities, (b) the factors each constituency believes contribute to successful collaboration, and (c) the expectations of accountability to successful collaboration that each constituency assigns to the other. The design of this study was non-experimental with the intention of exploring perceptions of collaborative group learning held by college-level learners and instructors. The focus of this study was to provide general information about participants through descriptive data, correlational statistics, and qualitative analysis. Two closely related multi-part surveys were used: one for college-level learners and one for instructors. Non-experimental data analysis included Pearson correlation to investigate associations among perception variables for value and instructor role. Independent *t-tests* and one-way ANOVA tested for significant differences in perceptions based on participant demographics. Multiple regression analysis tested for relationships between study variables and participant demographics. Qualitative data analysis was used to identify emerging themes in participant responses. Findings indicated that learners and instructors believed that collaborative group learning held pedagogical and professional value for them. Findings regarding accountability for success showed that both learners and instructors assigned more responsibility for group processes to students and more responsibility for the learning process to instructors. This finding is connected to other findings that revealed the complex functions of the instructor role in the collaborative processes, as evident in

results that indicated learners understood that they needed to take ownership of group processes but wanted the instructor to be active in the collaborative activity as well.

This chapter presents a discussion of conclusions and suggested implications based on the summarized findings in Chapter 4. The limitations of the findings and recommendations for future research are also included.

Learner Conclusions and Interpretations

Perception of Value and Benefits

What is the perceived value and benefit of collaborative group learning? The positive perception that learner participants' had of the value of collaborative group learning was shown to be based on the belief that it held pedagogical and professional benefits. This is confirmation of what other studies find where the perception of value and benefit associated with collaborative group learning derives from factors related to the learners' academic and/or career goals (Scribner et al., 2003; Volet & Mansfield, 2006; Woolf & Quinn, 2009). The strength of the relationship between the learner participants' perception that collaborative group learning supports the achievement of their learning goals and is an effective method of learning represents an alignment between learning goals and activities. This is an important finding because it has been reported by other researchers that although learners acknowledge the benefit of collaborative group learning it is not seen as an effective method of learning (Phipps et al., 2001; Tideswell, 2004). In addition, the alignment of learning goals with the learning method is reported to have a positive effect on the learners' willingness to participate in the collaborative group learning activity as a means of achieving his/her learning goals (Scardamalia & Bereiter, 1994). A positive relationship of interest concerning learning

goals in the current study is the finding that learner participants who perceive collaborative group learning to support the achievement of their learning goals also believe that they have the social and group skills needed to work effectively in a group.

Learner participants in the current study perceive that collaborative group learning will be beneficial to their future professional careers. This finding is consistent with other research (Scribner et al., 2003; Volet & Mansfield, 2006; Wolf & Quinn, 2009) that finds the professional benefits associated with collaborative activities influences learners' perceptions because it has relevance to him/her in the future. Furthermore, this study finds that there is a strong relationship between the perception of the professional benefits of collaborative group learning and the perception that it has pedagogical value and benefits. This is a confirmation of existing research (Scribner et al., 2003; Volet & Mansfield, 2006) that finds learners' perception of the instructional method derives from a belief that it will be of value because it will directly affect the development of skills that will be needed in their future professions. The perceived professional benefit of collaborative group learning also comes from findings in learner participants' responses concerning the factors affecting the perceived value and benefit of collaborative group learning. Learner participants mentioned that the value of collaborative group learning was based on work place demands that required a competency working in teams, and collaborative activities were seen as a way to develop group skills in preparation for professional careers.

A finding of interest from the current study regarding professional benefit was that learner participants who preferred to work alone while learning were less likely to perceive that collaborative group learning would be a benefit to their professional career.

Although this finding does agree with other research (King & Behnke, 2005; Phipps et al., 2001) that shows learner preference as a factor that affects perceptions of collaborative group learning, it would be expected that a relationship was found for learner preference and pedagogical value as well. This was not the case and it is unclear from the findings why only professional benefit and learner preference had a significant relationship. The only clue to this finding is found in a very few responses that indicate the learner preferred to work alone because it was perceived that they already possessed the skills needed to be successful in a professional career.

Learner participants' responses indicate that the value and benefit of collaborative group learning is in part due to factors associated with characteristics of the collaborative process, such as, group members sharing their diverse knowledge and experience to help find solutions and mentor their peers. Such interactions are the basis for participatory learning (Paavlo, 2004; Sfard, 1998) that supports problem solving from the collective knowledge of the group rather than the individual (Koschmann, 1996; Stahl, 2006) and is the means for creativity and exploration of possibilities (Mourtos, 1994; Thompson & Ku, 2006). The social context of collaboration is a defining characteristic; however, the social context was reported to be an uncomfortable situation for some learner participants because it meant having to deal with differing personalities, work styles, motivations and expectations of success. Being able to work with others is required in the collaborative process, and researchers Volet & Mansfield (2006) find that learners have negative experiences and perceptions of collaborative group learning when they are not prepared to deal with its informal structure and cope with the challenges of group processes. Closely related to this line of thinking is another finding from learner participant

responses in the current study that criticize the inclusion of collaborative activities as part of instruction on theoretical grounds alone. Learner participant responses mention that collaborative activities should be used to specifically address course objectives that focus on learning to work in groups and are accompanied by appropriate instruction.

The perceived value of collaborative group learning was also related to the factor of instructional effectiveness. Work and grade inequities, as responses in the current study show, have a negative effect upon the collaborative experience. Learner participants' reported that their perceived value of collaborative group learning is negatively affected when they find themselves doing more of the work and getting the same grade as others who contributed less. This phenomenon has also been reported in a number of other studies, all of which indicate that a common negative perception held by learners about collaborative group learning is based on group assessment and evaluation inequalities (Hansen, 2006; Jassawalla et al., 2008; Pfaff & Huddleston, 2003; Volet & Mansfield, 2006). Though equal contribution and reward is one concern for the division of labor, another is when division of labor, albeit equal, results in a piece-work approach being taken to complete a project. The negative learning implication for this strategy appears to be at the individual learning outcome level, because the end product is merely a compilation of individual tasks and this left learners feeling that their learning was limited and that they were unable to synthesize the aggregate knowledge. This scenario seems to negate the positive factors mentioned earlier as derived from knowledge sharing and co-creation of artifacts.

Perception of the Instructor Role

What role should the instructor play in collaborative group learning? The role of the instructor is reported to have a positive effect on learners' perception of collaborative group learning (Chapman & Auken, 2001), and learners report wanting more instructor involvement (Volet & Mansfield, 2006). Learner participant responses to the current study's investigation of the instructor's role in collaborative group learning revealed a complex interconnection of perceptions. Starting with instructor activities during the collaborative process, learner participants' believed, somewhat, that they should be left alone to work out group issues; however, they also believed, somewhat, that the instructor should play an active role in the collaborative activity. This relationship indicates that learners are willing to take ownership of the collaborative process but they still want the instructor to be involved as well.

Learner participants assigned the instructor 25% of the responsibility and students 75% of the responsibility for ensuring that the group works effectively together, indicating that learner participants understood and accepted the responsibility of the collaborative group process. However, this indicates that ensuring that a group works effectively is not entirely the learner participants' responsibility and this is reinforced by findings that show learner participants who assign students more responsibility for ensuring that the group works effectively did not believe that students should be left alone to resolve group issues but rather that instructors should play a more active role in the collaborative activity. When it comes to ensuring that the learning process is supported, learner participants' assigned the responsibility more evenly as 50% instructor and 50% students. Meanwhile, the balance of responsibility becomes more complicated

when considering that learner participants who assign students more responsibility for ensuring that a group works effectively were also more likely to assign the instructor more responsibility for ensuring that the learning process was supported.

According to learner participant responses the instructor role primarily falls into the categories of mentor, facilitator, and monitor. When learner participants were asked about the role of the instructor in collaborative group learning, being a mentor was mentioned as a role that would offer appropriate directions, suggestions, and insight. These functions are consistent with what other studies suggest for the instructor (King & Behnke, 2005; Tideswell, 2004). Mentoring was perceived by learner participants in the current study as an opportunity for instructors to teach learners how to work in a group effectively, something that researchers Chapman and Auken (2001) find has a positive correlation with learner attitudes toward group learning. However, learner participants warned that mentoring does not mean assuming control of the group but rather guiding the group so that over time it can be successful on its own.

The facilitator role was mentioned by learner participants, the primary function of which is to facilitate the process through providing structure and context and assistance with procuring technical, tactical, and any other types of resources necessary for the learners to take responsibility of learning. Another role that emerged in the findings was monitoring as a way to ensure progress of the individual and the group by raising alerts when a group was not functioning and determine if intervention was necessary. This finding is similar to what Chapman and Auken (2001) report as the need for the instructor to be aware of group issues and provide effective mechanisms for evaluating progress to avoid negative collaborative experiences that in turn creates negative perceptions of

collaborative group learning. However, responses indicate that a challenge for monitoring, as with all of the roles mentioned, is for the instructor to be able to discern when it is appropriate to intervene, and with what measures.

Factors Contributing to Collaborative Group Learning

What factors are believed to affect collaborative group learning? Learner participants in the current study reported positive and negative experiences of collaborative group learning and their beliefs about the positive and negative factors that contributed to those experiences. One factor mentioned as affecting the collaborative experience was the level of commitment and contribution to the success of the group on the part of individual learners. When individuals contributed equally and were willing to share expertise and experiences it was reported to have a positive effect on the collaborative experience. This finding confirms research by Towns et al. (2000) who report that learning is supported by a mutual commitment that is based on trust and interdependence and that when these elements are present it contributes to community building and peer mentoring. Whereas, as the current study reported, when individuals were unwilling to participate or only minimally contributed to the activity there was a negative effect. While an unwillingness to participate in the group has work inequity ramifications, so too does minimal contribution. Contribution to the group is reported to go beyond task completion and includes meeting the level of expectations for work quality within the group and completing work in a timely manner. A common negative experience reported in the current study was associated with a poor work ethic, and when other members did not fulfill their obligations or submitted sub-par work it had the effect of creating more work for the other members in the group. These findings reinforce what

Jasawalla et al. (2008) report in their study as complex learner perceptions of loafing that includes not only nonparticipation but also hindering behavior and unsatisfactory work.

Group interactions were mentioned as factors that affected learner participants' collaborative experiences. Group interactions based on communicating clearly and considerately help to strengthen relationships and allow members to disagree but still achieve a common goal. As a factor, communication was reported to be essential in keeping group members focused on their responsibilities in relation to the common goal; whereas, a lack of communication prevented groups from clarifying goals, roles, and other group functions. Interactions supporting relationship building affected the collaborative experience as well, and relationship building based on open and honest communication was instrumental to creating rapport among group members. Once rapport was established, it served as a firm foundation to support group functions and maintain a shared understanding and goal. Member attributes that fostered relationship building, such as amiability and openness, were factors that positively affected the collaborative experience. These findings on relationship building are confirmation of reports that identified a connection between positive interactions characterized by open dialogue, respect for others, and a sense of belonging to the development and maintenance of a mutual commitment to a common goal (Christie et al., 2007; Kreijns et al., 2004; Towns et al., 2000). A factor reported to undermine relationships and communication was the presence of a dominant personality that hampered open discussions and impeded the development of a shared understanding and goal in an effort to impose their will upon the rest of the group. A controlling member was also reported

to subvert positive interactions by creating an atmosphere of mistrust and lack of mutual respect.

Instructional characteristic factors associated with the role of the instructor as facilitator, leader, and supporter were reported to have positive effects on the collaborative experience and suggest that instructors should be actively engaged with learners providing them with clear guidance, expectations, and requirements. Instructor inaction was a negative factor that was reported to undermine the collaborative process, especially when an instructor is made aware of a problem but does not take any corrective actions. Findings show that authenticity is a positive factor because in an authentic experience learners related to the real-world aspect of the project and found it to be more compelling and relevant to their learning goals. This finding supports other research that show authentic learning to be essential in connecting ideas and concepts through learner interactions and thinking that is driven by the real-world context (Greeno, 1997; Jonassen et al., 2003). Findings suggest that authentic activities are a catalyst for individual interest that drives a willingness to participate and obliges learners to take personal responsibility for the success of the activity. However, when individual responsibility and accountability are lacking, work inequities arise and a commonly mentioned negative factor is work and reward inequities. The findings indicate that when one group member contributed less to the success of the group but was awarded equally it had a negative effect on the collaborative experience.

Instructor Conclusions and Interpretations

Perceived Value and Benefit

What is the perceived value and benefit of collaborative group learning?

Instructor participants' positive perception of the value and benefit of collaborative group learning is that it supports the achievement of students' learning goals and is an effective method of instruction. This finding contradicts the perception of instructors in the study done by Ahern (2007) where instructors report a reluctance to use collaborative group learning and do not value it as a method of instruction. It should be noted, however, that the instructor participants for Ahern's study have different characteristics than instructors in the current study. The current research finds a strong relationship between perceptions of collaborative group learning as a support for achieving learning goals and as an effective method of instruction. This indicates that instructors who more strongly believe that collaborative group learning supports the achievement of their students' learning goals will have a more positive perception of it as an effective method of instruction. This highlights a finding in instructor responses regarding the mention of learning goals and outcomes as factors affecting perceptions of the value and benefit of collaborative group learning. A perceived benefit of collaborative group learning is that it provides learners an opportunity to interact with others that may have very different personalities but still be effective in working together to achieve a goal. This finding is reinforced by other research that reports on the positive collaborative learning characteristics of interaction and consensus building that requires balancing diverse personalities, ideas, and relationships while working toward a common goal (Bruffee, 1993; Stahl, 2000; Thompson & Ku, 2006).

The current research study also finds that instructor participants have a very positive perception of collaborative group learning as a benefit to their students' future careers. This is consistent with Ahern's (2007) finding that instructors' positive perceptions of collaborative group learning are strongly related to its perceived professional benefit. The current study finds that there is a strong relationship between professional benefit and pedagogical value. This relationship indicates that instructors who believe collaborative group learning will benefit their students' future careers will also perceive it to be an effective method of learning for their students. This relationship was further solidified through responses by instructor participants that specifically mention that the value they associate with collaborative activities is strongly based on the learning goal of preparing learners for professional careers. Finally, to add yet another layer of value to the professional benefit of collaborative group learning, instructors who strongly believe that collaborative group learning is beneficial to their students' future professional careers prefer to be more proactive in monitoring and intervening in collaborative activities.

When instructor participants were asked to identify factors that affected the perceived value and benefits of collaborative group learning, implementation strategies were mentioned. One aspect of implementation strategies is consideration for inclusion of collaborative activities based on theoretical preference versus the appropriateness of the activity based on the learning situation and instructional objectives. The latter argument is in agreement with the study by Woolf & Quinn (2009) who report that the appropriateness of the activity has an influence on the perceived value of collaborative group learning and that inclusion of a collaborative activity should consider the relevancy

of the activity to other learning objectives. The instructor role was also mentioned as a consideration for implementation and indicates that the instructor needs to be aware of the time commitment collaborative activities entail, including an understanding of what is required to provide the structure and support necessary to facilitate effective group functions. Time and level of effort are issues reported by other researchers (Ahern, 2007; Hansen, 2006) and the implication from both studies, as well as the current one, is that there is often a misconception on the part of the instructor regarding the level of effort required to facilitate effective collaborative group activities.

Perception of Instructor Role

What role should the instructor play in collaborative group learning? According to the findings of the current study, instructor participants are slightly inclined to believe that students should be left alone to resolve group issues on their own. The findings also show that instructors who were more predisposed to leave students alone to resolve group issues were also more likely to believe that the instructor should not play an active role in the collaborative process. This is consistent with what Ahern (2007) finds in a study of instructor perspectives of collaborative group learning where most instructors reported leaving students alone during collaborative group activities to let them work out issues by themselves. The current study also finds that when it comes to a predisposition to leave students alone to resolve group issues, those instructors more inclined to leave students alone will also be more likely to assign students more of the responsibility for ensuring that a group works effectively and that the learning process is supported. This type of thinking on behalf of instructor participants connects to responses directed at the role of the instructor in relation to support oriented functions; that is the instructor should be a

facilitator of the learning process that assists with obtaining information, tools, and resources but should step back and let the group drive the process and learn to resolve issue on their own.

Instructors in the current study were slightly inclined to believe that instructors should play an active role in the collaborative activity and there were significant differences in belief about how active the instructor should be based on years of experience as an instructor. The findings show that instructors with more instructional experience were more likely to believe that instructors should play an active role in the collaborative activity. In addition, instructors that were inclined to believe that the instructor should play an active role in the collaborative process were more likely to be proactive in monitoring and intervening in collaborative activities and more likely to assign the instructor more responsibility for ensuring that a group works effectively. Findings from instructor participants' responses regarding the role of the instructor in collaborative group learning mentioned model oriented functions. Model oriented functions were described as providing best practice models, examples, and resources to learners during the collaborative process. Model oriented functions also included expert thinking as a means of helping learners become aware of strategies for successfully solving problems and handling group issues. These types of activities have also been suggested by other researchers as a way for instructors to become a more positive and proactive agent of collaborative group learning (Chapman & Auken, 2001).

When it comes to the assignment of responsibility for ensuring that a group worked effectively, the current study finds that instructors assigned responsibility as 50% instructor responsibility and 50% students' responsibility. Additionally, findings for the

current study show that instructors assigned responsibility for ensuring that the learning process was supported as 75% instructor and 25% students. When it came to accountability for the learning process, the results indicated that instructors that were more frequently involved in group work during their professional careers were more likely to assign the instructor a greater responsibility for ensuring that the learning process is supported. The implications of these findings appear to be addressed in instructor participant responses that mention the process and structure oriented functions as part of the instructor role.

Process oriented functions were mentioned as a way for the instructor to ensure the effectiveness of the group by monitoring progress and being aware of issues. It was recommended that activities such as observations, progress checks, and feedback loops could be used to monitor group functions. Process oriented responses point out that when the instructor is closer to group activities it provides opportunities to both model expectations and assess the level of learning that is taking place. This finding strengthens reports from other studies regarding the positive impact of instructor involvement in the collaborative process derived from ongoing assessment of group performance and discussion of group functions (Chapman & Auken, 2001; Hansen, 2006), as well as taking opportunities to teach learners how to collaborate effectively (Tideswell, 2004). However, it was warned that instructors should avoid becoming too involved in the process and taking over the group.

Structure oriented functions were mentioned as providing a framework of objectives, guidelines, tools, and expectations that would allow learners to take more responsibility of their own learning through mechanisms for assistance, feedback, and

evaluation. The indication from the responses was that a good structure would provide clear expectations and access to the appropriate academic and technical tools that give learners the confidence to succeed on their own. This finding is consistent with other research studies that report structure as a means of providing learners access to the instructor if they want it and bolster the feeling that the instructor is aware of what is going on with the group (Chapman & Auken, 2001; Jassawalla et al., 2008).

Factors Contributing to Collaborative Group Learning

What factors are believed to affect collaborative group learning? Instructor participants in the current study reported positive and negative experiences of collaborative group learning and their beliefs about the positive and negative factors that contributed to those experiences. Positive instructor responses for learner characteristics mentioned that when learners attended meetings, used their diverse skills, stayed focused, and worked hard, it had a positive effect on the collaborative experience. Other positive factors that contributed to both handling individual responsibilities and dealing with group processes included dedication, independence, and a desire to improve. Another positive factor that was mentioned was a willingness to take risks when considering problem solutions based on diverse views. In contrast, negative group experiences occurred when contributions were not valued by other group members or the diversity of cross-cultural issues could not be overcome and prevented the group from functioning properly. Negative instructor responses for learner characteristics also mentioned learners putting forth only minimum effort or not participating at all in activities. One implication taken from responses about minimum effort is that this not only was a cause of poor group functions but also resulted in improper academic behavior. A frequently mentioned

result of a lack of participation or poor effort on the part of some members was labor disparity when other members were required to do more work.

Instructor participants mentioned that clear communications and the sharing of ideas were instrumental in creating positive interaction among group members. These factors worked together to foster an environment of peer mentoring, resolving issues, sharing responsibility, and developing a common understanding. When these factors were not present learners' ability to agree on direction or settle group issues were impeded and the results were reported to be stalled group processes, lack of a common goal, differing expectations among group members, and no constructive dialogue. The findings show that developing good relations through open and honest communication supported group functions and group cohesion. These finding on the benefits of positive communication support other research that reports that positive social interactions has an effect upon how well the group functions because it encourages open discourse, assignment of roles, and clarification of responsibilities (Collis & Margolis, 2004; Lewis, 1997). In contrast, when group members did not treat each other with respect or take responsibility it evoked negative feelings within the group and affected the collaborative experience. Other negative factors that affected group relationships were the presence of a dominant personality, different learning styles and abilities, and differing expectations. Mention of these factors indicated that when personality conflicts and individual differences were not resolved the group was unable to function effectively. Findings pointed to the importance of developing rapport among members to mitigate the negative effects of these negative factors on the collaborative experience. This finding regarding rapport is consistent with Kreijns et al. (2004) who find that positive group interactions support group functions

because the group is able to address underlying socio-emotional issues effectively and work toward developing group cohesion. An interesting finding in the current study regarding rapport is that instructor participants reported that when group members had worked together previously they more quickly began to function as a group and become collaborative. However, it was also reported that when a team becomes too highly social it is at risk of becoming ineffective or stalling group progress.

Instructional characteristics noted by instructor participants regarding the instructor role were the functions of guidance, modeling, and monitoring. The findings reported that one function of the instructor was to provide direction but allow the group to make their own decisions. However, instructor participants noted that negative experiences occurred when learners did not follow guidance when provided. Another factor mentioned for the instructor role was that a lack of instruction contributed to negative collaborative experiences because learners were not adequately prepared to be successful in the activity. When interacting with learners, positive factors included the instructor being approachable, providing clear explanations, and giving encouragement.

The course attribute mentioned most frequently was an authentic course context and indicates that when learners find the subject to be interesting or compelling, learners feel engaged and have a catalyst for relationship building. A negative course attribute was group reward and findings strongly indicate that learners wanted to be rewarded individually for their contributions, especially if other members did not contribute equally. This finding is consistent across a number of studies that find a common negative perception of collaborative group learning held by learners and instructors is regarding the inequities associated group assessment and reward (Ahern, 2007; Hansen,

2006; King & Behnke, 2005; Pfaff & Huddleston, 2003; Volet & Mansfield, 2006). Peer evaluations also came up as a negative factor because some learners feared that their grade would be overly affected by peer evaluations that are based on receiving assistance from others in the group or the strength of relationships with other group members.

Practical Implications

By allowing IDT learners and instructors to express their beliefs and perceptions regarding the value and benefits, expectations of accountability, and success factors of collaborative group learning a baseline of similarities and differences has been developed. As a result, the findings of this study have significant practical implications that are important to researchers, instructional designers, and instructors.

Researcher Implications

The findings of this study are important to educational researchers because it synthesizes the existing disparate research into a more unified view and provides much needed instructor perceptions. Findings in this study show that learner participants' believe that collaborative group learning has both pedagogical and professional value. This finding is significant because it shows that the pedagogical factors do have importance. Similarly, findings show that instructor participants perceive collaborative group learning to support the achievement of learning goals and to be an effective method of learning. Instructor participants pointed out that the perception of value was affected by the value and benefit to learning outcomes associated with peer mentoring and knowledge sharing. These findings contradict other studies that have suggested that the primary reason for including collaborative group learning was because of its professional benefit (Ahern, 2007; Scribner et al., 2003) and that learners did not value it as an

effective method of instruction (Phipps et al., 2001; Tideswell, 2004). The implication for research is to identify and investigate specific instructional attributes and strategies used in collaborative group learning to determine their affect on perceived value.

Findings show that the accountability for the success of the collaborative group learning activity is perceived by learner participants and instructor participants to be a shared responsibility. Results of this study indicate that the balance of responsibility is skewed toward group process responsibility for the student and learning process responsibility for the instructor. This finding reveals a tension between learner and instructor participants who believe students should be left alone to work out group issues but that the instructor should active and those who believe that the instructor should not be active because learners must learn to work on their own. The complexity presented by this finding comes from responses by learners and instructors that describe varying levels of functions and activities for the instructor and the implication for research is to identify what methods of intervention are used and what affects they have on group processes and learning outcomes.

This study finds that instructor participants that are more inclined to leave students alone will also assign the students more of the responsibility to resolve group issues and ensure that learning processes are supported. This is a reinforcement of Ahern's (2007) findings that instructors perceive it to be the students' responsibility to work together and that the instructor should not be involved. It is also an indication of what Vik (2001) promotes as a strategy of stepping back from the group activity to give the learners responsibility for resolving team issues and solving problems. The findings seem to indicate that instructors take this approach because they believe that learners

must deal with the complexities of group work on their own and relate this to professional practice. The concern is whether the approach can be taken too far. The implication for research is to investigate the motivations behind using a “sink or swim” strategy and identify the academic and professional justifications for such an approach?

Findings of this study indicate that instructors with a higher frequency of group work as a professional will prefer to be more proactive. This may indicate that they are more comfortable with the group skills and processes needed for collaboration, but it may also be an indication that they understand the importance of instructor involvement to ensure group effectiveness. The latter argument connects to a desire on the part of learners for the collaborative group learning activity to more explicitly support the development of group work skills, as reported in the current findings. Another aspect to learning to work in groups comes from the finding that a number of learners and instructors believe that collaborative group learning activities help develop professional skills and already overlay it with professional qualities, such as references to professional roles for the instructor and parallels to “real-world” situations. The significance of connecting these disparate findings is that learners believe that part of the learning process should be to learn how to collaborate and work in groups effectively, especially if this is promoted as a benefit for professional careers. An implication for research would be to explore and identify what skills the work place is demanding and investigate the effectiveness of different approaches on skill development.

Instructional Design Implications

Findings from this study are of importance to instructional designers because they provide a basis for understanding the perceptions of learners and instructors that can

provide guidance for implementing effective collaborative group learning environments. An aspect of value that was highlighted for learners in this study is that a higher level of self-efficacy with social and group skills resulted in a more positive perception of the value of collaborative group learning. The important implication of this finding is that it supports the belief that preparing the learner for collaboration through instruction and development of the social and group skills necessary to work effectively in a group will have a positive effect upon the collaborative experience (Chapman & Auken, 2001; Gros, 2001; Tideswell, 2004). It would follow that these positive experiences would produce positive learner perceptions of collaborative group learning and possibly affect the learning and willingness to participate in the activity. The implication for instructional designers is to develop consistent and practical approaches to developing the necessary social and group skills.

Findings in this study indicate that learners acknowledge the benefits of collaborative group learning but find that in implementation these benefits can be elusive, especially when left to chance. It has been suggested in the findings that the use of collaborative group learning have explicit relevance to what is being learned, and furthermore that its principles be brought out so that they might be examined and practiced by the learner. A consideration for instructional designers in this regard is that the collaborative activity is more than a way to learn subject area content; it is an opportunity to learn how to collaborate and work in groups successfully. Although this point is not entirely missed by instructors, it appears from the findings of this study that few instructors took the time to prepare learners for collaboration or actually instructed them about collaboration. Instructor participant responses that support the explicit

teaching of collaboration mentioned modeling best practices and expert thinking, and also recommend that group processes be monitored in an effort to recognize opportunities to model expectations and provide guidance. The implication for instructional designers and developers is to create integrated subject matter and collaborative instruction that provides an opportunity for practice. Another implication is to identify and recommend instructional materials, mechanisms, and activities that promote learning to work in groups throughout the entire collaborative activity.

The findings show that work and grade inequities are a major consideration for learner and instructor participants. It seems apparent in the findings that there is a need for strategies that assess the learning outcomes of collaborative group learning, especially when it comes to individual learning. However, the responses from instructor participants reveal that measuring the actual learning outcomes for individuals is difficult. Newman et al. (1997) report that the difficulty of assessment derives from the need to analyze group members' interactions because that is where the evidence of critical thinking and learning will occur. The implication for instructional designers is that a process with supporting mechanisms needs to be developed to assist in assessing learning at the individual and group levels. One strategy may be to design modular collaborative activities that will build on each other as the project progresses, and allow for formative and summative evaluations at each interval that addresses both subject area learning and group process learning.

Instructor Implications

The current study findings have important implications for instructors because it identifies the perceptions of the instructor role and its impact upon collaborative group

learning that can be used to inform strategies for implementation. The findings in this study show that the social context of collaboration both supports and confounds the collaborative process. There is an indication that positive interactions and relationships promote the benefits of collaboration, while negative ones hinder the process. The implication for instructors is that providing time for relationship building is important because it will ultimately help the group become more effective. The findings indicated that one way to minimize time spent on forming relationships is to allow learners that have worked together before to form their own groups.

It appears from the instructor role findings that balancing instructor involvement and accountability is no simple matter, and while learners are taking responsibility for their own learning they are still holding the instructor accountable at some level. It is apparent from the findings that the instructor must be aware of group progress and discern if involvement is needed. The implication for instructors is to know when intervention is needed and to what degree. The findings suggest that being more actively engaged without taking over the group has the benefit of providing insight into group progress, while also providing opportunities for mentoring and guiding.

Results show that an authentic learning context is a positive factor for both learner and instructor participants. It appears that authenticity plays a part in the project being compelling and interesting because it brings relevance to the project. This supports research by Woolf and Quinn (2009) who find that the inclusion of a collaborative activity should consider the relevance and appropriateness of the activity to learning objectives because it will impact learners' perception of the collaborative activity. The implication for instructors is that some thought should be given to the inclusion of

authentic problems, tasks, tools, and even practitioners as a means of more fully engaging learners.

One concern that has emerged from the findings is to what extent the decision to include collaborative activities as part of instruction is based on accessing the benefits of collaboration. The findings suggest that some instructors implement collaborative group learning out of preference for its theoretical principles, because the programs they are part of demand it, or because the work place demands it. The concern for some learner participants was that instructors employed collaborative activities without it adding any learning value. The implication is that there are many approaches to group learning and the question for instructors seems to be whether collaboration is necessary or if another type of group work might suffice?

Results indicate that learner participants who believe students should be left alone to resolve group issues were less likely to perceive themselves as having the social and group skills needed to work effectively in a group. The nature of this relationship is not conclusive based on findings in this study; however, it is an indication of the dynamic social and individual issues that are active during the collaborative process, and there are a number of “what if” scenarios that might be played out to explore the implications of such a finding. Take for example, a learner with the preference to work alone who may also have poor social skills. It seems unlikely that the learner would be willing to participate in the group learning activity or be effective interacting with other group members. The likely outcome is that this learner, and possibly the entire group, will have a negative collaborative experience. However, there is also the possibility that the instructor, by taking an active role in mentoring and monitoring the collaborative process,

may be more aware of and able to address issues before they effect the group, if not on the part of the individual learner at least on behalf of the other group members.

Study Limitations

One limitation to this study is that it focused on a single academic discipline. By choosing only one academic area, the range and variety of experiences from which to draw upon was limited. In addition, by specifically choosing IDT students and instructors there is the risk that the data collected were reflective of a population that is already knowledgeable and concerned with instructional methods. As a result the familiarity with the theoretical aspects of this instructional method may be a factor as participants consider their responses. However, the choice of IDT participants was based in part on this very reason and the expectation that the participants would have had group learning experiences within the recent past.

Another limitation of this study is that by utilizing an anonymous online survey for data collection the researcher will not be able to follow-up or pursue further explanations from the participants. Because data were self-reported, the accuracy of responses is taken with good faith and the anonymity of the survey prohibits the verification of responses, especially regarding recall of experiences. Though the open-ended questions were meant to provide opportunities for explanations and clarification, there are design considerations that limit them in scope and flexibility.

Recommendations for Further Research

In consideration of the findings, first, it is recommended that further research study a broader range of academic disciplines gathering both learner and instructor perceptions. Choosing IDT may have set up the best case scenario for getting positive

responses due to the confounding influence of instructional theory which is likely part of most participants' academic learning. Gathering data from other academic disciplines will help to identify similarities and differences between learners and instructors, especially if they are not aware of the theoretical benefits of collaboration. Second, it is recommended that studies attempt to gather data on younger, less experienced learners to give a fuller picture of the perceptions of collaborative group learning as having pedagogical and professional value. The age and professional experience of IDT learners may have affected the positive results because they were more mature and had significant professional experience.

Third, it is recommended to measure the instructor role as a prior experience variable, as well as an ideal state variable as done in this study. The results for this study do not relate current disposition toward collaborative group learning to prior instructor activities. This type of data would possibly help to bring clarity to the balance of instructor roles highlighted in the current study. Fourth, it is recommended that research concerning the effects of relevancy and appropriateness be included to provide a more accurate picture of how these factors affect the perception of value, willingness to participate, and the instructor role. Fifth, it is recommended that the requirements for professional practice be researched to provide a stronger basis for inclusion of collaborative activities that address explicit learning objectives and skill development. Finally, is the recommendation to gather more data from instructors about their perceptions of the pedagogical value of collaborative group learning, their activities in collaborative group learning, and the affect those activities have on the collaborative process and learning outcomes.

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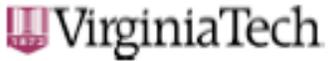
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Appendix A

IRB Approval



Office of Research Compliance
Carmen T. Green, IRB Administrator
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Blacksburg, Virginia 24061
540/231-4338 Fax 540/231-0959
e-mail ctgreen@vt.edu
www.irb.vt.edu
FWA00000572 (exempt 1/00/0010)
IRB # is IRB00000667

DATE: October 22, 2009

MEMORANDUM

TO: Jennifer Brill
Thomas Jeffrey

FROM: Carmen Green 

SUBJECT: IRB Exempt Approval: "Instructional Design and Technology Student and Instructor Perceptions of Collaborative Group Learning", IRB # 09-392

I have reviewed your request to the IRB for exemption for the above referenced project. The research falls within the exempt status, CFR 46.101(b) category(ies) 2.

Approval is granted effective as of October 22, 2009.

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

1. Report promptly proposed changes in the research protocol. 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.

cc: File

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE UNIVERSITY AND STATE UNIVERSITY

Appendix B

Initial Email Inviting Participation

E-Mail Subject Line: Collaborative Group Learning Research Study: Participation Request

Dear Instructional Technology Faculty, Students and Recent Graduates,

As someone who is attending or teaching at a university that offers an Instructional Design and Technology program, you are invited to participate in a research study designed to help better understand the perceptions held by students and instructors regarding the value, success factors and expectations of accountability regarding collaborative group learning in higher education. Participation is voluntary.

To participate, simply click the following web address:

<http://filebox.vt.edu/users/tjeffrey/consent.html>

The link will take you to an informed consent form that outlines the details of this study. After submitting this form, you will automatically be taken to the survey. It is estimated that it will take you approximately 15 minutes to complete. It would be most appreciated if you would complete this survey prior to December 31, 2009.

While there is no compensation for your participation, your participation in this study may be beneficial as you reflect upon your own experiences and perceptions. The results of this study may serve to influence future implementation of and research into group learning. However, no promise or guarantee of benefits is being made to encourage you to participate.

Thank you for considering this survey.

Sincerely,
Thomas R. Jeffrey,
Doctoral Candidate,
Instructional Design and Technology,
Virginia Polytechnic Institute and State University

Appendix C

Reminder Email Addendums Inviting Participation

First Reminder E-Mail Subject Line: Reminder: Collaborative Group Learning Research Study: Participation Request

Dear Teaching Faculty and Students,

Body content addendums are as follows:

Please Note: Survey Closes on Wednesday, December 31, 2009.

As a member of the Instructional Design and Technology community, your participation is very valuable in gathering data regarding collaborative group learning.

Attach original email here (Appendix A).

I apologize if you have received this message even though you have already participated in this study. Given respondent anonymity, I am unable to selectively resend this reminder to those that have yet to respond.

Appendix D

Final Reminder Email Addendums Inviting Participation

E-Mail Subject Line: Final Reminder: Collaborative Group Learning Research Study: Participation Request

Dear Teaching Faculty and Students,

Body content addendums are as follows:

Final Reminder: Survey Closes Tomorrow Night

As a member of the Instructional Design and Technology community, your participation is very valuable in gathering data regarding collaborative group learning.

Attach original email here (Appendix A).

I apologize if you have received this message even though you have already participated in this study. Given respondent anonymity, I am unable to selectively resend this reminder to those that have yet to respond.

Appendix E

Online Informed Consent Form

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY Informed Consent for Participants in Research Projects Involving Human Subjects

Title of Project:

Instructional Design and Technology Student and Instructor Perceptions of Collaborative Group Learning

Investigator(s):

Thomas R. Jeffrey, School of Education, Virginia Tech

Research Advisor(s):

Jennifer M. Brill, Ph.D., School of Education, Virginia Tech

I. Purpose of this Research/Project

The purpose of this study is to investigate the perceptions held by students and instructors regarding the value, success factors and expectations of accountability regarding collaborative group learning in higher education. The potential participant pool for the study includes students attending or instructors teaching at United States colleges and universities offering an Instructional Design and Technology (IDT) program. Participating students must be graduate status and have been involved in at least one group learning activity in class within the last twelve months. Participating instructors must have included at least one group learning activity in a course during the last twelve months.

II. Procedures

This survey will be conducted online at a time convenient to you before December 31, 2009. In addition to reading this form and submitting your consent to participate in this study, you are encouraged to keep a copy of it for your records. It is estimated that you will be able to complete this survey in 15 to 20 minutes. After providing consent, you will be presented with criterion for determining if your experience meets the definition of collaborative group learning used for this study. If you meet the criteria you will take the appropriate survey for your academic standing (student or instructor). Upon submitting this survey, your participation will be complete.

III. Risks and Benefits

There are no anticipated risks to you as a result of participating in this study. Findings from this study could benefit instructors regarding ways to improve group effectiveness and enhance collaboration. While there is no compensation for your participation, your participation in this study may be beneficial as you reflect upon your own experiences and perceptions. The results of this study may serve to influence future implementation of and research into group learning. However, no promise or guarantee of benefits is being made to encourage you to participate.

IV. Extent of Anonymity and Confidentiality

The only people who will have access to the data collected from this study will be the investigator and the research advisor. All study data will be kept in a secure location by the investigator. Your participation in this study will be completely confidential. Further, when publishing the results of this study, the names of all participating institutions and individuals will be omitted or a pseudonym given.

V. Compensation

Participants will not be compensated for participating in this study. Participation is strictly voluntary.

VI. 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; to do so, please quit out of your web browser. Further, you may refuse to answer any questions you don't want to answer and still remain in the study.

VIII. Subject's Responsibilities

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

1. Submit this "Informed Consent" form,
2. Complete the survey that follows, and
3. Submit the survey once complete.

IX. Subject's Permission

I have read this Informed Consent Form and the conditions of this project. By clicking the "Provide Consent" button below, I have had all of my questions answered, agree to participate in this study, and accept that my consent will be electronically supplied to the researcher to document my participation in this study.

["Provide Consent" button located here on the online form]

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:

Investigator:	Thomas R. Jeffrey	270-465-7444	tjeffrey@vt.edu
Faculty Advisor:	Dr. Jennifer Brill	540-231-8328	jnbrill@vt.edu
Chair, IRB:	David M. Moore	540-231-4991	moored@vt.edu

Appendix F

Learner Survey Instrument

Survey of Learner Perceptions

Pre-Survey Information

**VIRGINIA POLYTECHNIC INSTITUTE AND STATE
UNIVERSITY**

**Instructional Design and Technology Student and Instructor Perceptions of
Collaborative Group Learning**

Are you a student or instructor?



Criteria

For this survey, group learning is defined as a method of instruction that consists of the following:

- Informal setting (group members decide time/place of at least some meetings; this can involve dedicated classroom time)
- Informal structure (group members decide on tasks, roles, and other group functions)
- Small group size (3-5 members)
- Ill-structured project/problem (development project, case study)
- Time frame is at least 3 weeks

In the last twelve months of your academic work or instruction, were you involved in at least one project that met the above criteria?

- No - [Click here](#)
- Yes - [Click here](#)

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Student Survey

Perceptions of Collaborative Group Learning

The purpose of this study is to gather information regarding perceptions of collaborative group learning based upon your actual learning experiences and beliefs. The survey will take approximately 15 minutes to complete.

Instructions: This survey consists of eight parts and will ask you for demographic information as well as your perceptions and opinions regarding your collaborative group learning experiences as a student. It is important to this study that a full portrayal of collaborative group learning perspectives be developed. Therefore, as you answer the following questions, please consider:

- Your actual attitudes and beliefs based on your experiences.
- That an accurate representation of your thoughts may include both positive and negative aspects.
- The definition of collaborative groups used for this study includes the following:
 - Informal setting (group members decide time/place of at least some meetings; this can involve dedicated classroom time)
 - Informal structure (group members decide on tasks, roles, and other group functions)
 - Small group size (3-5 members)
 - Ill-structured project/problem (development project, case study)
 - Time frame is at least 3 weeks

Thank you for taking the time to provide answers to this survey. All of your responses will be kept confidential in any reporting of the research results.

Recent Group Learning Experiences

Please supply the following information regarding your academic experience in the previous twelve months.

How many projects were you involved in that meet the definition of collaborative group learning used for this study? Please list all that apply on separate lines in the following format:

Project name, Course name, Number in group
(ex. Developing Instruction, Intro to Instructional Design, 4)

Demographic Information

Please supply the following information regarding your personal and professional background.

What is your gender?

- Female Male

What is your age?

- 20 to 29 30 to 39 40 to 49 50 to 59 60 to 69 70 or above

What is your nationality?

How many years of experience do you have working as a professional in any field?

- None 1-5 6-10 11 or more

How many years of experience do you have working in the field of instructional design and technology, or a closely related field?

- None 1-5 6-10 11 or more

In your professional career, how often have you been a part of a group working on a project?

- Never Seldom Occasionally Often Always

Attitude and Satisfaction

Please indicate your agreement with each statement below.

I like to participate in collaborative group learning activities.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Collaborative group learning activities are important to my learning experience.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

I am satisfied with the learning outcomes of my involvement in collaborative group learning activities.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

I am satisfied with the learning experiences related to my involvement in collaborative group learning activities.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Value and Benefit

Please indicate your agreement with each statement below.

Based on my experience, I believe that ...

Collaborative group learning supports the achievement of my learning goals.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Collaborative group learning is an effective instructional method of learning for me.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Participating in collaborative group learning will be beneficial to my future career.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

What additional comments, either positive and negative, do you have regarding collaborative group learning value and benefits.

For the following question consider your actual experiences as a participant in collaborative group learning activities.

Why do you believe instructors assign collaborative group learning activities? Provide an example if necessary.

Instructor Role

Please indicate your agreement with each statement below.

Based on my experience, I believe that ...

Students need to be left alone and discover for themselves how to resolve issues that arise within the group.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Instructors should play an active role in collaborative group learning activities.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Instructors should discuss with students the benefits of working in groups.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Instructors should attempt to minimize unequal work and grade rewards within groups.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Instructors should allow students to openly discuss prior experiences with group work.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Instructors should provide guidance on how to approach group work as a process.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Please provide additional comments that may help clarify your responses regarding instructor activities:

For the following questions, select the instructor/student pairing that most closely reflects your beliefs.

In a collaborative group learning environment, whose responsibility is it to ensure that a group works effectively?

- 100% instructor
- 75% instructor/25% students
- 50% instructor/50% students
- 25% instructor/75% students
- 100% students

In a collaborative group learning environment, whose responsibility is it to ensure that the learning process is supported?

- 100% instructor
- 75% instructor/25% students
- 50% instructor/50% students
- 25% instructor/75% students
- 100% students

For the following question consider your actual experiences as a participant in collaborative group learning activities.

What role should the instructor play in the collaborative group learning activity, and why? Provide examples if necessary.

Factors Effecting Collaborative Group Learning

For the following questions, base your responses on those activities that meet the definition of group learning used for this study and your actual experiences as a participant.

Describe an example of a positive group experience that has left the biggest impression on you and list several of the contributing factors that made it a positive experience?

Describe an example of a negative group experience that has left the biggest impression on you and list several of the contributing factors that made it a negative experience?

Efficacy of Self and Others

Please indicate your agreement with each statement below.

Based on my experience, I believe that ...

I have the social and group skills needed to work effectively in a group.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Most other students have the social and group skills needed to work effectively in a group.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Most of my instructors have an understanding of the social and group skills needed to work effectively in a group.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Please provide any additional comments about the efficacy of self and others with regard to social and group skills.

Willingness to Participate

Please indicate your agreement with each statement below.

I prefer to work alone when learning.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

When working in a group, I like to take control of deciding what needs to be done to ensure success.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

If another group member wants to do all of the work, I will let them.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

In my experience, the benefits of group activities are not worth the time commitment they require.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

I would like to participate in collaborative group learning activities in the future.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

What factors most effect your level of participation in and commitment to a collaborative group learning activity?

Conclusion of Survey

Would you like to participate in any follow-up studies based on your responses to this survey?

If yes, please supply an email address:

If you would like to help expand the reach of this study and know of an Instructional Design and Technology instructor or graduate student who would likely be involved in collaborative group learning, please supply potential participant email addresses below:

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Appendix G

Instructor Survey Instrument

Survey of Instructor Perceptions

Pre-Survey Information

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Instructional Design and Technology Student and Instructor Perceptions of Collaborative Group Learning

Are you a student or instructor?

Student

Instructor 

Criteria

For this survey, group learning is defined as a method of instruction that consists of the following:

- Informal setting (group members decide time/place of at least some meetings; this can involve dedicated classroom time)
- Informal structure (group members decide on tasks, roles, and other group functions)
- Small group size (3-5 members)
- Ill-structured project/problem (development project, case study)
- Time frame is at least 3 weeks

In the last twelve months of your academic work or instruction, were you involved in at least one project that met the above criteria?

- No - [Click here](#)
- Yes - [Click here](#)

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Instructor Survey

Perceptions of Collaborative Group Learning

The purpose of this study is to gather information regarding perceptions of collaborative group learning based upon your actual instructional experiences and beliefs. The survey will take approximately 15 minutes to complete.

Instructions: This survey consists of eight parts and will ask you for demographic information as well as your perceptions and opinions regarding your collaborative group learning experiences as an instructor. It is important to this study that a full portrayal of collaborative group learning perspectives be developed. Therefore, as you answer the following questions, please consider:

- Your actual attitudes and beliefs based on your experiences.
- That an accurate representation of your thoughts may include both positive and negative aspects.
- The definition of collaborative groups used for this study includes the following:
 - Informal setting (group members decide time/place of at least some meetings; this can involve dedicated classroom time)
 - Informal structure (group members decide on tasks, roles, and other group functions)
 - Small group size (3-5 members)
 - Ill-structured project/problem (development project, case study)
 - Time frame is at least 3 weeks

Thank you for taking the time to provide answers to this survey. All of your responses will be kept confidential in any reporting of the research results.

Recent Group Learning Experiences

Please supply the following information regarding your academic experience in the previous twelve months.

How many projects did you require that meet the definition of collaborative group learning used for this study? Please list all that apply on separate lines in the following format:

Project name, Course name, Number enrolled, Number of groups
(ex. Developing Instruction, Intro to Instructional Design, 35, 7)

Demographic Information

Please supply the following information regarding your personal and professional background.

What is your age?

- 20 to 29 30 to 39 40 to 49 50 to 59 60 to 69 70 or above

What is your gender?

- Female Male

What is your nationality?

How many years of experience do you have as an instructor in higher education ?

- None 1-5 6-10 11 or more

How many years of experience do you have working as a professional in any field?

- None 1-5 6-10 11 or more

How many years of experience do you have working in the field of instructional design and technology, or a closely related field?

- None 1-5 6-10 11 or more

In your professional career, how often have you been a part of a group working on a project?

- Never Seldom Occasionally Often Always

Attitude and Satisfaction

Please indicate your agreement with each statement below.

I like to include collaborative group learning activities in my courses.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Collaborative group learning activities are important to my instructional approach.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

I am satisfied with the learning outcomes of students involved in collaborative group learning activities in my courses.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

I am satisfied with the learning experiences related to student's involvement in collaborative group learning activities in my courses.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Value and Benefit

Please indicate your agreement with each statement below.

Based on my experience, I believe that ...

Group learning is a valuable part of my student's learning experience.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Students perceive group learning to be a valuable part of their learning experience.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Collaborative group learning supports the achievement of my student's learning goals.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Collaborative group learning is an effective instructional method of learning for my student's.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Participating in collaborative group learning will be beneficial to my student's future career.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

What additional comments, either positive and negative, do you have regarding collaborative group learning value and benefits.

For the following question consider your actual experiences as an instructor.

Why do you assign collaborative group learning activities? Provide an example if necessary.

Instructor Role

Please indicate your agreement with each statement below.

Based on my experience, I believe that ...

Students need to be left alone and discover for themselves how to resolve issues that arise within the group.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Instructors should play an active role in collaborative group learning activities.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Instructors should discuss with students the benefits of working in groups.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Instructors should attempt to minimize unequal work and grade rewards within groups.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Instructors should allow students to openly discuss prior experiences with group work.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Instructors should provide guidance on how to approach group work as a process.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Please provide additional comments that may help clarify your responses regarding instructor activities:

For the following questions, select the instructor/student pairing that most closely reflects your beliefs.

In a collaborative group learning environment, whose responsibility is it to ensure that a group works effectively?

- 100% instructor
- 75% instructor/25% students
- 50% instructor/50% students
- 25% instructor/75% students
- 100% students

In a collaborative group learning environment, whose responsibility is it to ensure that the learning process is supported?

- 100% instructor
- 75% instructor/25% students
- 50% instructor/50% students
- 25% instructor/75% students
- 100% students

For the following question consider your actual experiences as an instructor and your participation in collaborative group learning activities.

What role should the instructor play in the collaborative group learning activity, and why? Provide examples if necessary.

Factors Effecting Collaborative Group Learning

For the following questions, base your responses on those activities that meet the definition of group learning used for this study and your actual experiences as an instructor.

Describe an example of a positive group experience for students in one of your courses that has left the biggest impression on you and list several of the contributing factors that made it a positive experience?

Describe an example of a negative group experience for students in one of your courses that has left the biggest impression on you and list several of the contributing factors that made it a negative experience?

Efficacy of Self and Others

Please indicate your agreement with each statement below.

Based on my experience, I believe that ...

I have an understanding of the social and group skills needed to work effectively in a group.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Most students have the social and group skills needed to work effectively in a group.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Please provide any additional comments about the efficacy of self and others with regard to social and group skills.

Willingness to Participate

Please indicate your agreement with each statement below.

In my experience as an instructor ...

I proactively monitor and intervene in the collaborative group learning activities in my courses.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

The benefits of group activities are not worth the time commitment they require from me.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Collaborative group learning activities lack individual accountability.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

Collaborative group learning activities are difficult to assess.

Strongly Disagree Disagree Slightly Disagree Slightly Agree Agree Strongly Agree

What additional comments do you have concerning your willingness to monitor and intervene in collaborative group learning activities in your courses?

Conclusion of Survey

Would you like to participate in any follow-up studies based on your responses to this survey?

If yes, please supply an email address:

If you would like to help expand the reach of this study and know Instructional Design and Technology instructors or graduate students who may have been involved in collaborative group learning, please supply any potential participant email addresses below:

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Appendix H

Program Director Preface to Email Inviting Participation

Subject Line: Collaborative Group Learning Research Study: Participation Request

Instructional Design and Technology Program Director:

I am conducting research on perceptions of collaborative group learning and I am contacting you to request your help in reaching IDT students and recent graduates. It would be much appreciated if you would forward this request for participation to students in your program or to a listserv of interest as a means of assisting me in broadening the reach of this study. Thank you for your consideration in this matter.

Attach original email here (Appendix A).

Appendix I

Learner Demographic Summative Tables

This appendix consists of summative tables for learner demographics.

Table I1:

Learner: Demographics

Variable	Category	<i>n</i>	Valid Percent
Gender ^a	Female	27	61.4
	Male	17	38.6
Age (<i>M</i> =2.42, <i>SD</i> =.988)	20 to 29	8	17.8
	30 to 39	18	40
	40 to 49	11	24.4
	50 to 59	8	17.8
	60 to 69	-	-
	70 or above	-	-
Years of experience working as a professional (<i>M</i> =3.24, <i>SD</i> =.802)	None	-	-
	1 to 5	10	22.2
	6 to 10	14	31.1
	11 or more	21	46.7
Years of experience working in IDT (<i>M</i> =2.56, <i>SD</i> =.867)	None	4	8.9
	1 to 5	19	42.2
	6 to 10	15	33.3
	11 or more	7	15.6
Frequency of group work in professional career (<i>M</i> =3.82, <i>SD</i> =.834)	Never	1	2.2
	Seldom	2	4.4
	Occasionally	8	17.8
	Often	27	60.0
	Always	7	15.6

^aMissing value = 1

Appendix J

Learner Results – Value Variables Summative Tables

This appendix consists of summative tables for value variables and demographics used in statistical analysis for learner participants.

Table J1:

Learner: Descriptive Statistics for Value Variables

Variable	Category	<i>n</i>	Valid Percent
Supports learning goals (<i>M</i> =4.49, <i>SD</i> =1.325)	Strongly Disagree	3	6.7
	Disagree	1	2.2
	Slightly Disagree	5	11.1
	Slightly Agree	5	11.1
	Agree	24	53.3
	Strongly Agree	7	15.6
Pedagogical value (<i>M</i> =4.38, <i>SD</i> =1.512)	Strongly Disagree	3	6.7
	Disagree	4	8.9
	Slightly Disagree	3	6.7
	Slightly Agree	10	22.2
	Agree	13	28.9
	Strongly Agree	12	26.7
Professional benefit ^a (<i>M</i> =4.82, <i>SD</i> =1.402)	Strongly Disagree	2	4.5
	Disagree	2	4.5
	Slightly Disagree	3	6.8
	Slightly Agree	6	13.6
	Agree	13	29.5
	Strongly Agree	18	40.9

^aMissing value = 1

Table J2:

Learner: Descriptive Statistics for Supports Learning Goals Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	27	4.44	1.368
	Male	17	4.53	1.328
Age	20 to 29	8	4.75	.886
	30 to 39	18	4.33	1.495
	40 to 49	11	4.18	1.662
	50 to 59	8	5.00	.535
	60 to 69	-	-	-
	70 or above	-	-	-
Years of experience working as a professional	None	-	-	-
	1 to 5	10	4.70	.675
	6 to 10	14	4.79	1.051
	11 or more	21	4.19	1.662
Years of experience working in IDT	None	4	4.00	2.000
	1 to 5	19	4.68	.820
	6 to 10	15	4.53	1.598
Frequency of group work in professional career	11 or more	7	4.14	1.574
	Never	1	5.00	-
	Seldom	2	4.00	1.414
	Occasionally	8	4.75	1.581
	Often	27	4.37	1.391
	Always	7	4.71	.951

Table J3:

Learner: Summary of Multiple Regression Results for Supports Learning Goals and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	5.326	1.257		4.236	.000
Gender	.173	.441	.064	.392	.697
Age	.420	.283	.313	1.482	.147
Years experience as a professional	-.730	.376	-.438	-1.938	.060
Years experience in field of IDT	.096	.295	.063	.326	.746
Frequency of group work in professional career	.002	.278	.001	.007	.995

Note. $R^2 = .310$, Adjusted $R^2 = -.023$.

Table J4:

Learner: Descriptive Statistics for Pedagogical Value Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	27	4.37	1.497
	Male	17	4.35	1.618
Age	20 to 29	8	4.25	1.2826
	30 to 39	18	4.28	1.708
	40 to 49	11	4.18	1.722
	50 to 59	8	5.00	.926
	60 to 69	-	-	-
	70 or above	-	-	-
Years of experience working as a professional	None	-	-	-
	1 to 5	10	4.40	1.174
	6 to 10	14	4.71	1.437
	11 or more	21	4.14	1.711
Years of experience working in IDT	None	4	3.75	1.893
	1 to 5	19	4.74	1.147
	6 to 10	15	4.40	1.765
Frequency of group work in professional career	11 or more	7	3.71	1.604
	Never	1	4.00	-
	Seldom	2	4.00	2.828
	Occasionally	8	4.75	1.669
	Often	27	4.26	1.583
	Always	7	4.57	.976

Table J5:

Learner: Summary of Multiple Regression Results for Pedagogical Value and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	4.906	1.440		3.406	.002
Gender	.125	.505	.040	.247	.806
Age	.531	.325	.347	1.636	.110
Years experience as a professional	-.613	.431	-.322	-1.421	.164
Years experience in field of IDT	-.133	.338	-.076	-.393	.697
Frequency of group work in professional career	.084	.318	.046	.263	.794

Note. $R^2 = .088$, Adjusted $R^2 = -.032$.

Table J6:

Learner: Descriptive Statistics for Professional Benefit Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	26	4.77	1.451
	Male	17	4.88	1.409
Age	20 to 29	8	4.88	.991
	30 to 39	18	4.67	1.680
	40 to 49	10	4.90	1.287
	50 to 59	8	5.00	1.414
	60 to 69	-	-	-
	70 or above	-	-	-
Years of experience working as a professional	None	-	-	-
	1 to 5	10	4.90	.876
	6 to 10	14	5.07	1.141
	11 or more	20	4.60	1.759
Years of experience working in IDT	None	4	5.50	1.000
	1 to 5	18	5.06	.938
	6 to 10	15	4.67	1.633
Frequency of group work in professional career	11 or more	7	4.14	1.952
	Never	1	6.00	-
	Seldom	2	4.50	2.121
	Occasionally	8	5.25	.707
	Often	26	4.69	1.644
	Always	7	4.71	.951

Table J7:

Learner: Summary of Multiple Regression Results for Professional Benefit and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	5.766	1.324		4.356	.000
Gender	.360	.466	.126	.772	.445
Age	.292	.298	.206	.978	.335
Years experience as a professional	-.238	.404	-.135	-.590	.559
Years experience in field of IDT	-.458	.315	-.284	-1.455	.154
Frequency of group work in professional career	-.054	.293	-.032	-.184	.855

Note. $R^2 = .113$, Adjusted $R^2 = -.007$.

Table J8:

Learner: Between Group Test Results for Value Variables and Demographics

Variable and demographic	Result
Supports learning goals	
Gender	$t(42) = .203, p > .05$
Age	$F(3, 41) = .768, p > .05$
Years of experience working as a professional	$F(2, 42) = 1.011, p > .05$
Years experience in field of IDT	$F(3, 41) = .466, p > .05$
Frequency of group work in professional career	$F(4, 40) = .268, p > .05$
Pedagogical value	
Gender	$t(42) = .036, p > .05$
Age	$F(3, 41) = .657, p > .05$
Years of experience working as a professional	$F(2, 42) = .590, p > .05$
Years experience in field of IDT	$F(3, 41) = 1.040, p > .05$
Frequency of group work in professional career	$F(4, 40) = .221, p > .05$
Professional Benefit	
Gender	$t(41) = -.253, p > .05$
Age	$F(3, 40) = .123, p > .05$
Years of experience working as a professional	$F(2, 41) = .476, p > .05$
Years experience in field of IDT	$F(3, 40) = 1.094, p > .05$
Frequency of group work in professional career	$F(4, 39) = .431, p > .05$

Appendix K

Learner Results – Instructor Role Variables Summative Tables

This appendix consists of summative tables for instructor role variables and demographics used in statistical analysis for learner participants.

Table K1:

Learner: Descriptive Statistics for Instructor Role Variables

Variable	Category	<i>n</i>	Valid Percent
Leave students alone (<i>M</i> =3.52, <i>SD</i> =1.455)	Strongly Disagree	3	6.7
	Disagree	8	17.8
	Slightly Disagree	14	31.1
	Slightly Agree	8	17.8
	Agree	6	13.3
	Strongly Agree	6	13.3
Active instructor (<i>M</i> =4.20, <i>SD</i> =1.254)	Strongly Disagree	1	2.2
	Disagree	4	8.9
	Slightly Disagree	6	13.3
	Slightly Agree	15	33.3
	Agree	12	26.7
Group process accountability (<i>M</i> =3.80, <i>SD</i> =.815)	Strongly Agree	7	15.6
	100% instructor	-	-
	75% instr./25% stud.	3	6.7
	50% instr./50% stud.	11	24.4
	25% instr./75% stud.	23	51.1
Learning process accountability (<i>M</i> =2.56, <i>SD</i> =.943)	100% students	8	17.8
	100% instructor	6	13.3
	75% instr./25% stud.	15	33.3
	50% instr./50% stud.	18	40.0
	25% instr./75% stud.	5	11.1
	100% students	1	2.2

Table K2:

Learner: Descriptive Statistics for Leave Students Alone Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	27	3.52	1.602
	Male	17	3.65	1.222
Age	20 to 29	8	3.88	1.246
	30 to 39	18	3.39	1.461
	40 to 49	11	3.73	1.737
	50 to 59	8	3.25	1.389
	60 to 69	-	-	-
	70 or above	-	-	-
Years of experience working as a professional	None	-	-	-
	1 to 5	10	3.40	1.350
	6 to 10	14	3.29	1.541
	11 or more	21	3.76	1.480
Years of experience working in IDT	None	4	4.00	1.414
	1 to 5	19	3.32	1.416
	6 to 10	15	3.27	1.534
Frequency of group work in professional career	11 or more	7	4.43	1.272
	Never	1	3.00	-
	Seldom	2	3.00	1.414
	Occasionally	8	3.88	1.642
	Often	27	3.48	1.424
	Always	7	3.57	1.718

Table K3:

Learner: Summary of Multiple Regression Results for Leave Students Alone And Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	2.641	1.384		1.908	.064
Gender	.004	.485	.001	.009	.993
Age	-.423	.312	-.290	-1.355	.184
Years experience as a professional	.591	.414	.326	1.425	.162
Years experience in field of IDT	.062	.324	.037	.192	.849
Frequency of group work in professional career	-.033	.306	-.019	-.107	.915

Note. $R^2 = .071$, Adjusted $R^2 = -.051$.

Table K4:

Learner: Descriptive Statistics for Active Instructor Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	27	4.19	1.210
	Male	17	4.24	1.393
Age	20 to 29	8	3.63	1.685
	30 to 39	18	4.17	1.249
	40 to 49	11	4.73	.789
	50 to 59	8	4.13	1.246
	60 to 69	-	-	-
	70 or above	-	-	-
Years of experience working as a professional	None	-	-	-
	1 to 5	10	3.30	1.636
	6 to 10	14	4.97	1.072
	11 or more	21	4.71	.902
Years of experience working in IDT	None	4	5.50	.577
	1 to 5	19	3.63	1.383
	6 to 10	15	4.33	.900
Frequency of group work in professional career	11 or more	7	4.71	1.113
	Never	1	5.00	-
	Seldom	2	3.00	1.414
	Occasionally	8	4.63	1.598
	Often	27	4.19	1.145
	Always	7	4.00	1.291

Table K5:

Learner: Summary of Multiple Regression Results for Active Instructor and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	2.613	1.069		2.444	.019
Gender	-.128	.375	-.050	-.341	.735
Age	-.296	.241	-.233	-1.229	.227
Years experience as a professional	1.096**	.320	.694	3.423	.001
Years experience in field of IDT	-.160	.251	-.110	-.639	.526
Frequency of group work in professional career	-.167	.236	-.110	-.707	.484

Note. $R^2 = .272$, Adjusted $R^2 = -.177$. ** $p < .001$

Table K6:

Learner: Descriptive Statistics for Group Process Accountability Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	27	3.89	.847
	Male	17	3.65	.786
Age	20 to 29	8	3.88	.354
	30 to 39	18	3.78	1.003
	40 to 49	11	3.45	.820
	50 to 59	8	4.25	.463
	60 to 69	-	-	-
	70 or above	-	-	-
Years of experience working as a professional	None	-	-	-
	1 to 5	10	3.90	.568
	6 to 10	14	4.07	.829
	11 or more	21	3.57	.870
Years of experience working in IDT	None	4	3.25	.500
	1 to 5	19	3.89	.658
	6 to 10	15	4.07	.884
Frequency of group work in professional career	11 or more	7	3.29	.951
	Never	1	4.00	-
	Seldom	2	3.50	.707
	Occasionally	8	3.75	.463
	Often	27	3.74	.944
	Always	7	4.14	.690

Table K7:

Learner: Summary of Multiple Regression Results for Group Process Accountability and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	4.352	.745		5.840	.000
Gender	-.201	.261	-.120	-.768	.447
Age	.309	.168	.374	1.839	.074
Years experience as a professional	-.516	.223	-.503	-2.314	.206
Years experience in field of IDT	.090	.175	.096	.517	.608
Frequency of group work in professional career	.107	.165	.108	.650	.520

Note. $R^2 = .162$, Adjusted $R^2 = -.051$.

Table K8:

Learner: Descriptive Statistics for Learning Process Accountability Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	27	2.59	1.010
	Male	17	2.53	.874
Age	20 to 29	8	2.75	.886
	30 to 39	18	2.39	.850
	40 to 49	11	2.27	.786
	50 to 59	8	3.13	1.246
	60 to 69	-	-	-
	70 or above	-	-	-
Years of experience working as a professional	None	-	-	-
	1 to 5	10	2.50	.850
	6 to 10	14	2.57	.852
	11 or more	21	2.57	1.076
Years of experience working in IDT	None	4	3.00	.816
	1 to 5	19	2.58	.902
	6 to 10	15	2.67	1.047
Frequency of group work in professional career	11 or more	7	2.00	.816
	Never	1	4.00	-
	Seldom	2	2.00	1.414
	Occasionally	8	2.75	1.035
	Often	27	2.44	.847
	Always	7	2.71	1.113

Table K9:

Learner: Summary of Multiple Regression Results For Learning Process Accountability and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	2.792	.896		3.115	.003
Gender	.050	.314	.026	.158	.875
Age	.129	.202	.135	.639	.527
Years experience as a professional	.095	.268	.081	.356	.724
Years experience in field of IDT	-.323	.210	-.297	-1.538	.132
Frequency of group work in professional career	-.021	.198	-.019	-.108	.915

Note. $R^2 = .088$, Adjusted $R^2 = -.032$.

Table K10:

Learner: Between Group Test Results for Instructor Role Variables and Demographics

Variable and demographic	Result
Leave students alone	
Gender	$t(42) = -.283, p > .05$
Age	$F(3, 41) = .788, p > .05$
Years of experience working as a professional	$F(2, 42) = .492, p > .05$
Years experience in field of IDT	$F(3, 41) = 1.362, p > .05$
Frequency of group work in professional career	$F(4, 40) = .205, p > .05$
Active instructor	
Gender	$t(42) = -.126, p > .05$
Age	$F(3, 41) = .788, p > .05$
Years of experience working as a professional	$F(2, 42) = 5.272, p < .05^*$
Years experience in field of IDT	$F(3, 41) = 3.788, p > .05$
Frequency of group work in professional career	$F(4, 40) = .821, p > .05$
Learning Process Accountability	
Gender	$t(42) = .947, p > .05$
Age	$F(3, 41) = 1.557, p > .05$
Years of experience working as a professional	$F(2, 42) = 1.735, p > .05$
Years experience in field of IDT	$F(3, 41) = 2.359, p > .05$
Frequency of group work in professional career	$F(4, 40) = .413, p > .05$
Learning Process Accountability	
Gender	$t(42) = .212, p > .05$
Age	$F(3, 41) = 1.678, p > .05$
Years of experience working as a professional	$F(2, 42) = .021, p > .05$
Years experience in field of IDT	$F(3, 41) = 1.196, p > .05$
Frequency of group work in professional career	$F(4, 40) = .988, p > .05$

* $p < .05$ (2-tailed)

Appendix L

Instructor Demographic Summative Tables

This appendix consists of summative tables for instructor demographics.

Table L1:

Instructor: Demographics

Variable	Category	<i>n</i>	Valid Percent
Gender	Female	19	43.2
	Male	25	56.8
Age ^a (<i>M</i> =3.70, <i>SD</i> =1.206)	20 to 29	2	4.7
	30 to 39	6	14.0
	40 to 49	8	18.6
	50 to 59	15	34.9
	60 to 69	11	25.6
	70 or above	1	2.3

^aMissing value = 1

Table L2:

Instructor: Professional Experience

Variable	Category	<i>n</i>	Valid Percent
Years of experience as instructor (<i>M</i> =3.36, <i>SD</i> =.810)	None	-	-
	1 to 5	9	20.5
	6 to 10	10	22.7
	11 or more	25	56.8
Years of experience working as a professional (<i>M</i> =3.77, <i>SD</i> =.565)	None	-	-
	1 to 5	3	6.8
	6 to 10	4	9.1
	11 or more	37	84.1
Years of experience working in IDT (<i>M</i> =3.59, <i>SD</i> =.726)	None	-	-
	1 to 5	6	13.6
	6 to 10	6	13.6
	11 or more	32	72.7
Frequency of group work in professional career (<i>M</i> =4.02, <i>SD</i> =.505)	Never	-	-
	Seldom	-	-
	Occasionally	5	11.4
	Often	33	75.0
	Always	6	13.6

Appendix M

Instructor Results – Value Variables Summative Tables

This appendix consists of summative tables for value variables and demographics used in statistical analysis for instructor participants.

Table M1:

Instructor: Descriptive Statistics for Value Variables

Variable	Category	<i>n</i>	Valid Percent
Supports learning goals (<i>M</i> =5.18, <i>SD</i> =.786)	Strongly Disagree	-	-
	Disagree	1	2.3
	Slightly Disagree	-	-
	Slightly Agree	4	9.1
	Agree	24	54.5
	Strongly Agree	15	34.1
Pedagogical value ^a (<i>M</i> =5.14, <i>SD</i> =.966)	Strongly Disagree	1	2.3
	Disagree	-	-
	Slightly Disagree	-	-
	Slightly Agree	7	16.3
	Agree	18	41.9
	Strongly Agree	17	39.5
Professional benefit (<i>M</i> =5.64, <i>SD</i> =.685)	Strongly Disagree	-	-
	Disagree	-	-
	Slightly Disagree	1	2.3
	Slightly Agree	2	4.5
	Agree	9	20.5
	Strongly Agree	32	72.7

^aMissing value = 1

Table M2:

Instructor: Descriptive Statistics for Supports Learning Goals Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	19	5.37	.597
	Male	25	5.04	.889
Age	20 to 29	2	5.50	.707
	30 to 39	6	5.33	.516
	40 to 49	8	5.50	.756
	50 to 59	15	5.20	.561
	60 to 69	11	4.64	1.027
	70 or above	1	6.00	-
Years of experience as an instructor	None	-	-	-
	1 to 5	9	5.56	.527
	6 to 10	10	5.10	.568
	11 or more	25	5.08	.909
Years of experience working as a professional	None	-	-	-
	1 to 5	3	5.33	.577
	6 to 10	4	5.25	.500
	11 or more	37	5.16	.834
Years of experience working in IDT	None	-	-	-
	1 to 5	6	5.167	.606
	6 to 10	6	5.125	.262
	11 or more	32	5.156	.995
Frequency of group work in professional career	Never	-	-	-
	Seldom	-	-	-
	Occasionally	5	5.20	.447
	Often	33	5.12	.857
	Always	6	5.50	.548

Table M3:

Instructor: Summary of Multiple Regression Results for Supports Learning Goals and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	5.019	1.545		3.249	.003
Gender	-.203	.270	-.129	-.751	.457
Age	-.182	.144	-.280	-1.266	.214
Years experience as an instructor	-.090	.201	-.092	-.466	.658
Years experience as a professional	.049	.356	.035	.137	.892
Years experience in field of IDT	.040	.294	.037	.135	.893
Frequency of group work in professional career	.281	.270	.180	1.040	.305

Note. $R^2 = .138$, Adjusted $R^2 = -.006$.

Table M4:

Instructor: Descriptive Statistic for Pedagogical Value Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	19	5.32	.749
	Male	25	5.00	1.103
Age	20 to 29	2	5.00	-
	30 to 39	6	4.83	.753
	40 to 49	8	5.50	.756
	50 to 59	15	5.40	.632
	60 to 69	11	4.60	1.506
	70 or above	1	5.00	-
Years of experience as an instructor	None	-	-	-
	1 to 5	9	5.33	.707
	6 to 10	10	5.02	.632
	11 or more	25	5.04	1.160
Years of experience working as a professional	None	-	-	-
	1 to 5	3	4.67	.577
	6 to 10	4	4.75	.500
	11 or more	37	5.22	1.017
Years of experience working in IDT	None	-	-	-
	1 to 5	6	4.83	.408
	6 to 10	6	5.17	.753
	11 or more	32	5.19	1.078
Frequency of group work in professional career	Never	-	-	-
	Seldom	-	-	-
	Occasionally	5	6.00	-
	Often	33	4.67	1.076
	Always	6	5.67	.516

Table M5:

Instructor: Summary of Multiple Regression Results for Pedagogical Value and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	2.665	1.919		1.388	.174
Gender	-.085	.335	-.044	-.255	.800
Age	-.191	.179	-.238	-1.065	.294
Years experience as an instructor	-.129	.249	-.108	-.518	.608
Years experience as a professional	.523	.443	.306	1.182	.245
Years experience in field of IDT	.008	.365	.006	.021	.983
Frequency of group work in professional career	.434	.335	.227	1.294	.204

Note. $R^2 = .143$, Adjusted $R^2 = -.003$.

Table M6:

Instructor: Descriptive Statistics for Professional Benefit Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	19	5.74	.452
	Male	25	5.56	.821
Age	20 to 29	2	5.50	.707
	30 to 39	6	5.67	.516
	40 to 49	8	5.63	.744
	50 to 59	15	5.80	.414
	60 to 69	11	5.36	1.027
	70 or above	1	6.00	-
Years of experience as an instructor	None	-	-	-
	1 to 5	9	5.78	.441
	6 to 10	10	5.60	.516
	11 or more	25	5.60	.816
Years of experience working as a professional	None	-	-	-
	1 to 5	3	6.00	-
	6 to 10	4	5.50	.577
	11 or more	37	5.62	.721
Years of experience working in IDT	None	-	-	-
	1 to 5	6	5.83	.408
	6 to 10	6	5.50	.548
	11 or more	32	5.63	.751
Frequency of group work in professional career	Never	-	-	-
	Seldom	-	-	-
	Occasionally	5	5.40	.548
	Often	33	5.61	.747
	Always	6	6.00	-

Table M7:

Instructor: Summary of Multiple Regression Results for Professional Benefit and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	5.272	1.379		3.823	.001
Gender	-.221	.241	-.162	-.919	.364
Age	.003	.129	.004	.019	.985
Years experience as an instructor	-.008	.179	-.010	-.047	.963
Years experience as a professional	-.114	.318	-.094	-.359	.722
Years experience in field of IDT	-.077	.263	-.082	-.295	.770
Frequency of group work in professional career	.358	.241	.264	1.484	.146

Note. $R^2 = .096$, Adjusted $R^2 = -.054$.

Table M8:

Instructor: Between Group Test Results for Value Variables and Demographics

Variable and demographic	Result
Supports learning goals	
Gender	$t(42) = .172, p > .05$
Age	$F(5, 37) = 1.810, p > .05$
Years of experience as an instructor	$F(2, 41) = 1.300, p > .05$
Years of experience working as a professional	$F(2, 41) = .079, p > .05$
Years experience in field of IDT	$F(2, 41) = .124, p > .05$
Frequency of group work in professional career	$F(2, 41) = .580, p > .05$
Pedagogical value	
Gender	$t(41) = .292, p > .05$
Age	$F(5, 36) = 1.222, p > .05$
Years of experience as an instructor	$F(2, 40) = .314, p > .05$
Years of experience working as a professional	$F(2, 40) = .810, p > .05$
Years experience in field of IDT	$F(2, 40) = .341, p > .05$
Frequency of group work in professional career	$F(2, 40) = 1.051, p > .05$
Professional Benefit	
Gender	$t(42) = .403, p > .05$
Age	$F(5, 37) = .552, p > .05$
Years of experience as an instructor	$F(2, 41) = .232, p > .05$
Years of experience working as a professional	$F(2, 41) = .499, p > .05$
Years experience in field of IDT	$F(2, 41) = .360, p > .05$
Frequency of group work in professional career	$F(2, 41) = 1.185, p > .05$

Appendix N

Instructor Results – Instructor Role Variables Summative Tables

This appendix consists of summative tables for instructor role variables and demographics used in statistical analysis for instructor participants.

Table N1:

Instructor: Descriptive Statistics for Instructor Role Variables

Variable	Category	<i>n</i>	Valid Percent
Leave students alone (<i>M</i> =3.84, <i>SD</i> =1.180)	Strongly Disagree	1	2.3
	Disagree	5	11.4
	Slightly Disagree	10	22.7
	Slightly Agree	15	34.1
	Agree	10	22.7
	Strongly Agree	3	6.8
Active instructor (<i>M</i> =4.34, <i>SD</i> =.987)	Strongly Disagree	-	-
	Disagree	2	4.5
	Slightly Disagree	6	13.6
	Slightly Agree	15	34.1
	Agree	17	38.6
Group process accountability (<i>M</i> =3.45, <i>SD</i> =.697)	Strongly Agree	4	9.1
	100% instructor	1	2.3
	75% instr/25% stud.	1	2.3
	50% instr/50% stud	20	45.5
	25% instr/75% stud	21	47.7
Learning process accountability (<i>M</i> =2.27, <i>SD</i> =.727)	100% students	1	2.3
	100% instructor	5	11.4
	75% instr/25% stud.	24	54.5
	50% instr/50% stud	13	29.5
	25% instr/75% stud	2	4.5
	100% students	-	-

Table N2:

Instructor: Descriptive Statistics for Leave students Alone Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	19	3.89	1.286
	Male	25	3.80	1.118
Age	20 to 29	2	4.00	1.414
	30 to 39	6	3.50	.548
	40 to 49	8	3.75	1.488
	50 to 59	15	3.87	1.187
	60 to 69	11	3.73	1.191
	70 or above	1	5.00	-
Years of experience as an instructor	None	-	-	-
	1 to 5	9	3.67	1.225
	6 to 10	10	4.10	.994
	11 or more	25	3.80	1.258
Years of experience working as a professional	None	-	-	-
	1 to 5	3	4.00	1.00
	6 to 10	4	3.75	.957
	11 or more	37	3.84	1.236
Years of experience working in IDT	None	-	-	-
	1 to 5	6	3.67	1.211
	6 to 10	6	3.67	1.033
	11 or more	32	3.91	1.228
Frequency of group work in professional career	Never	-	-	-
	Seldom	-	-	-
	Occasionally	5	3.80	1.095
	Often	33	3.97	1.075
	Always	6	3.17	1.722

Table N3:

Instructor: Summary of Multiple Regression Results for Leave Students Alone and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	7.605	2.360		3.22	.033
Gender	-.294	.412	-.125	-.714	.480
Age	.262	.220	.268	1.191	.241
Years experience as an instructor	-.284	.307	-.195	-.925	.361
Years experience as a professional	-.787	.545	-.377	-1.445	.150
Years experience in field of IDT	.660	.449	.406	1.470	.150
Frequency of group work in professional career	-.676	.413	-.290	-1.640	.110

Note. $R^2 = .108$, Adjusted $R^2 = -.041$.

Table N4:

Instructor: Descriptive Statistics for Active Instructor by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	19	4.53	.905
	Male	25	4.20	1.041
Age	20 to 29	2	5.00	1.414
	30 to 39	6	4.17	.753
	40 to 49	8	4.13	1.356
	50 to 59	15	4.53	.834
	60 to 69	11	4.18	1.079
	70 or above	1	5.00	-
Years of experience as an instructor	None	-	-	-
	1 to 5	9	4.78	.833
	6 to 10	10	3.70	.949
	11 or more	25	4.44	.961
Years of experience working as a professional	None	-	-	-
	1 to 5	3	4.67	1.155
	6 to 10	4	4.25	.500
	11 or more	37	4.32	1.029
Years of experience working in IDT	None	-	-	-
	1 to 5	6	4.83	.983
	6 to 10	6	4.00	.632
	11 or more	32	4.31	1.030
Frequency of group work in professional career	Never	-	-	-
	Seldom	-	-	-
	Occasionally	5	4.40	1.140
	Often	33	4.27	1.008
	Always	6	4.67	.816

Table N5:

Instructor: Summary of Multiple Regression Results for Active Instructor and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	7.605	2.360		3.22	.033
Gender	-.294	.412	-.125	-.714	.480
Age	.262	.220	.268	1.191	.241
Years experience as an instructor	-.284	.307	-.195	-.925	.361
Years experience as a professional	-.787	.545	-.377	-1.445	.150
Years experience in field of IDT	.660	.449	.406	1.470	.150
Frequency of group work in professional career	-.676	.413	-.290	-1.640	.110

Note. $R^2 = .108$, Adjusted $R^2 = -.041$.

Table N6:

Instructor: Descriptive Statistics for Group Process Accountability Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	19	3.32	.820
	Male	25	3.58	.584
Age	20 to 29	2	3.50	.707
	30 to 39	6	3.67	.516
	40 to 49	8	3.63	.916
	50 to 59	15	3.40	.507
	60 to 69	11	3.27	.905
	70 or above	1	4.00	-
Years of experience as an instructor	None	-	-	-
	1 to 5	9	3.38	.744
	6 to 10	10	3.70	.483
	11 or more	25	3.44	.735
Years of experience working as a professional	None	-	-	-
	1 to 5	3	3.33	.577
	6 to 10	4	3.75	.500
	11 or more	37	3.43	.728
Years of experience working in IDT	None	-	-	-
	1 to 5	6	3.17	.753
	6 to 10	6	3.67	.516
	11 or more	32	3.48	.724
Frequency of group work in professional career	Never	-	-	-
	Seldom	-	-	-
	Occasionally	5	3.20	.837
	Often	33	3.55	.564
	Always	6	3.20	1.304

Table N7:

Instructor: Summary of Multiple Regression Results for Group Process Accountability and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	2.970	1.378		2.156	.038
Gender	.369	.241	.265	1.533	.134
Age	-.184	.129	-.319	-1.434	.160
Years experience as an instructor	-.032	.179	-.037	-.179	.859
Years experience as a professional	-.076	.318	-.061	-.238	.813
Years experience in field of IDT	.336	.262	.349	1.280	.209
Frequency of group work in professional career	-.056	.241	-.040	-.232	.818

Note. $R^2 = .129$, Adjusted $R^2 = -.016$.

Table N8:

Instructor: Descriptive Statistics for Learning Process Accountability Stratified by Demographics

Variable	Category	<i>n</i>	Mean	Std. Deviation
Gender	Female	19	2.32	.820
	Male	25	2.24	.663
Age	20 to 29	2	2.50	.707
	30 to 39	6	2.33	.516
	40 to 49	8	2.50	.926
	50 to 59	15	2.47	.743
	60 to 69	11	1.91	.539
	70 or above	1	2.00	-
Years of experience as an instructor	None	-	-	-
	1 to 5	9	2.00	.756
	6 to 10	10	2.40	.843
	11 or more	25	2.36	.638
Years of experience working as a professional	None	-	-	-
	1 to 5	3	2.33	.577
	6 to 10	4	2.50	.577
	11 or more	37	2.28	.741
Years of experience working in IDT	None	-	-	-
	1 to 5	6	2.17	.753
	6 to 10	6	2.00	.632
	11 or more	32	2.39	.715
Frequency of group work in professional career	Never	-	-	-
	Seldom	-	-	-
	Occasionally	5	2.20	.837
	Often	33	2.42	.663
	Always	6	1.60	.548

Table N9:

Instructor: Summary of Multiple Regression Results for Learning Process Accountability and Demographics

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
(Constant)	3.455	1.280		2.701	.010
Gender	.026	.226	.018	.113	.910
Age	-.225	.117	-.383	-1.917	.063
Years experience as an instructor	.182	.172	.203	1.058	.297
Years experience as a professional	-.372	.292	-.299	-1.272	.212
Years experience in field of IDT	.499	.244	.515	2.047	.058
Frequency of group work in professional career	-.341	.227	-.235	-1.499	.142

Note. $R^2 = .267$, Adjusted $R^2 = .267$.

Table N10:

Instructor: Between Group Test Results for Instructor Role Variables

Variable and demographic	Result
Leave students alone	
Gender	$t(42) = .795, p > .05$
Age	$F(5, 37) = .308, p > .05$
Years of experience as an instructor	$F(2, 41) = .711, p > .05$
Years of experience working as a professional	$F(2, 41) = .037, p > .05$
Years experience in field of IDT	$F(2, 41) = .173, p > .05$
Frequency of group work in professional career	$F(2, 41) = 1.189, p > .05$
Active instructor	
Gender	$t(42) = .283, p > .05$
Age	$F(5, 37) = .509, p > .05$
Years of experience as an instructor	$F(2, 41) = 3.475, p < .05^*$
Years of experience working as a professional	$F(2, 41) = .179, p > .05$
Years experience in field of IDT	$F(2, 41) = 1.124, p > .05$
Frequency of group work in professional career	$F(2, 41) = .403, p > .05$
Learning Process Accountability	
Gender	$t(42) = .255, p > .05$
Age	$F(5, 37) = .458, p > .05$
Years of experience as an instructor	$F(2, 41) = .825, p > .05$
Years of experience working as a professional	$F(2, 41) = .411, p > .05$
Years experience in field of IDT	$F(2, 41) = .788, p > .05$
Frequency of group work in professional career	$F(2, 41) = 1.132, p > .05$
Learning Process Accountability	
Gender	$t(42) = .339, p > .05$
Age	$F(5, 37) = 1.039, p > .05$
Years of experience as an instructor	$F(2, 41) = 1.635, p > .05$
Years of experience working as a professional	$F(2, 41) = .228, p > .05$
Years experience in field of IDT	$F(2, 41) = .628, p > .05$
Frequency of group work in professional career	$F(2, 41) = 4.875, p < .05^*$

* $p < .05$ (2-tailed)