PRESENCE, AGENCY, AND CONTEXT:
STUDENTS' EXPERIENCES ENGAGING IN CREATIVE GROUP PROCESSES IN AN ONLINE EDUCATIONAL ENVIRONMENT

by

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Submitted in partial fulfilment of the requirements for

the degree of Master of Information

at

Dalhousie University

Halifax, Nova Scotia

April 2021

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Abstract

Cooperative learning, a pedagogical technique by which students learn with and from each other by participating in purposefully designed and facilitated educational activities, has been shown to improve student learning outcomes and increase motivation and engagement. Group assignments are employed as part of a cooperative learning experience; however, many university students are resistant to group assignments, finding them more difficult and less rewarding than individual work, and often reporting frustration with aspects of group assignments that are out of their control. Often, group assignments are used by instructors with varying degrees of supports and constraints in attempts to foster the soft skills students will need when entering the workplace, such as teamwork, communication, and creativity. Of particular interest are creative group processes, as conditions needed to successfully carry out these processes are typically varied and difficult to control, and also require unique supports when conducted in the online environment into which the large majority of university students and instructors were thrust due to the COVID-19 pandemic. The experiences of these involuntary online students, those who have been forced into online learning due to circumstances outside of their control, had not been substantially investigated previously. By conducting interviews with 13 student participants and gathering survey responses from 374 students enrolled in online undergraduate and graduate courses at Dalhousie University in the Fall 2020 semester, and synthesizing findings with those of prior research, this study has identified university students' preferences, beliefs, and perceptions concerning group work and creative group processes in an online environment. A blended theoretical framework has emerged, illustrating the significance of the interaction of social presence, cognitive presence, teaching presence, and agency, as well as the influence of multiple layers of context, on an individual student's experience engaging in creative group processes in an online environment. This study has shown that a blended framework incorporating central elements from social constructivism, Sensemaking, the Community of Inquiry framework, and the Social Cognitive Theory of Agency allows for the development of a more complete understanding of students' experiences participating in creative group processes in an online environment than any of these constructs alone. This blended theoretical framework, along with overall findings from this study, also points to the increased significance of the course instructor in an online environment, especially their responsibility for creating conditions that foster creativity through purposefully designed and thoughtfully facilitated group assignments. In addition, this research offers practical contributions for university students and instructors by confirming the recommendations of prior research for implementing cooperative learning at the university level and adding additional considerations specific to group creativity.

List of Abbreviations Used

CoI – Community of Inquiry framework (Garrison et al., 2000)

SCToA – Social Cognitive Theory of Agency (Bandura, 2001)

Glossary

Agency: the capability to exercise influence over one's life and experiences through direct personal, proxy, and/or communal means (Bandura, 2001)

Community of Inquiry framework: the interaction of three central elements, cognitive presence, social presence, and teaching presence, which create a worthwhile educational experience (Garrison et al., 2000)

Cognitive presence: the extent to which students construct meaning through seeking information, exploring ideas, and interacting with each other (Garrison et al., 2001)

Cooperative learning: "shift(s) the focus of teaching from lecturing to groups of mostly passive students to instruction through orchestrating students' interactions with each other. In cooperative learning, instruction focuses on coordinating, stimulating, and encouraging interactions among students, with students expected to learn from their own activities and interaction with their peers" (Shimazoe & Aldrich, 2010, p. 52)

Creativity: "the generation of novel and useful ideas" (Gong et al., 2009, p. 765)

Creative group processes: the communicative and collaborative processes groups undertake for the purpose of arriving at novel and useful solutions to assignment tasks

Evaluation apprehension: the fear of being judged for contributing an idea that could be viewed as 'bad' by others in the group (Diehl & Stroebe, 1987; Diehl & Stroebe, 1991; Paulus & Nijstad, 2003)

Face-to-face student: a student who has chosen to enroll in a program delivered in a face-to-face format

Free riding: when a member of a group relies on others to contribute ideas and carry out more than their share of the work (Paulus & Nijstad, 2003)

Group: two or more people working together to achieve their intentions. "Groups include three types of elements: a) people who become a group's members, b) intentions that are embodied in group projects, and c) resources that comprise the group's technologies" (McGrath et al., 2000, p. 98)

Group cohesion: a group's sense of unity or togetherness

Idea Fixation: the tendency for groups to focus on ideas held in common and to avoid voicing divergent ideas (Diehl & Stroebe, 1987; Diehl & Stroebe, 1991; Paulus & Nijstad, 2003)

Information: a "structural representation and at the same time... something that the human species, because of the discontinuity mandate in the human condition, makes and then challenges and unmakes and remakes as events move forward" (Dervin, 1999, p. 738)

Involuntary online student: a face-to-face student (see definition above) who has been forced into online learning due to circumstances outside of their control, such as the COVID-19 pandemic

Nominal group: individuals generating ideas alone and then combining their ideas later (Diehl & Stroebe, 1987)

Online student: a student who has chosen to enroll in a program delivered in an online format

Production blocking: when one or more member(s) of a group inhibits others from contributing (Diehl & Stroebe, 1987; Diehl & Stroebe, 1991; Paulus & Nijstad, 2003)

Sensemaking metatheory: the sense made at a "particular point in time-space by someone" (Dervin, 1998, p. 36); applies a central metaphor of "human beings traveling through time-space, coming out of situations with history and partial instruction, arriving at new situations, facing gaps, building bridges across those gaps, evaluating outcomes and moving on" (p. 39)

Social Cognitive Theory of Agency: "Social cognitive theory distinguishes among three modes of agency: direct personal agency, proxy agency that relies on others to act on one's behest to secure desired outcomes, and collective agency exercised through socially coordinative and interdependent effort" (Bandura, 2000, p. 1)

Social constructivism interpretive framework: according to this paradigm, "individuals seek understanding of the world in which they live and work" and "develop subjective meanings of their experiences" (Creswell & Poth, 2018, p. 24)

Social presence: the ability of students to convey their sense of self to others and establish shared social identity within the community (Garrison, 2009)

Teaching presence: the structures and processes instructors provide for students through the design and facilitation of learning activities and the learning environment (Garrison et al., 2000)

Acknowledgements

Thank you to the students of Dalhousie University for sharing your preferences, beliefs, and perceptions through participation in this study, allowing me to give voice to your experiences.

Thank you to my thesis supervisors, Dr. Sandra Toze and Dr. Colin Conrad, for your guidance, support, and encouragement throughout the research process and beyond. Thank you to Dr. Vivian Howard and Dr. Suzanne Le-May Sheffield, for providing such valuable feedback as part of my supervisory committee, and to my external reader, Lindsay McNiff, for your thoughtful and insightful comments and suggestions.

And, of course, thank you to my husband, Raymond, for your encouragement, patience, and humour, and for convincing me that I know what I'm doing.

Chapter 1: Introduction

1.1 Context

In education, cooperative learning, a structured educational approach in which students learn with and from each other by working toward a common goal (Marzano, 2007), is often considered to be an important tool for increasing student engagement and motivation, as well as a method of helping students develop the communication and collaboration skills that are essential for success in the modern workplace. Rather than teacher-centred lectures with passive student learning, cooperative learning is a student-centred approach that gives students agency over their own personal and community knowledge-building (Shimazoe & Aldrich, 2010). As Johnson et al. (2007) explained, "cooperative learning is one of the success stories of both psychology and education," which is perhaps due to "the close relationship between theory, research, and practice" (p. 15). Benefits of cooperative learning for students include the promotion of self-regulated learning, improvement in social-emotional skill development and civic reasoning abilities, and the development of higher order thinking skills (Shimazoe & Aldrich, 2010). In addition to benefiting students, cooperative learning can improve instructors' abilities to formatively assess and reflect on their students' learning and provide targeted feedback (Marzano, 2007), and can also lighten their grading load (Shimazoe & Aldrich, 2010). Though cooperative learning is more than just assigning students to work in groups, group work is a technique employed as part of a cooperative learning experience.

Despite theoretical, research-based, and practical evidence regarding benefits and successful outcomes of cooperative learning, Shimazoe and Aldrich (2010) noted that

there is often resistance to implementing this approach, especially at the post-secondary level. As Colbeck et al. (2000) explained, many university instructors lack the training necessary to successfully implement cooperative learning. Even though, when employed with fidelity, cooperative learning can significantly improve teaching and learning, assigning group work without the scaffolding and support integral to the cooperative learning framework can lead to difficult and frustrating experiences for everyone involved (Marzano, 2007). These sub-optimal experiences not only affect students' learning, motivation, and ability to do well in particular courses, they also impact their development of skills necessary to succeed in their future careers. As Succi and Canovi (2020) explained, soft skills, such as teamwork skills, conflict management and negotiation skills, and communication skills, are increasingly valued by employers over specific hard/technical skills and competencies. In addition, the workplace has undergone changes as technology has advanced, seeing shifts toward more temporary, dynamic teams, often conducting at least some of their work remotely and asynchronously (Tannenbaum et al., 2012). These changes have contributed to the need for flexibility and adaptability on the part of employees, including the ability to seamlessly adjust to communicating and collaborating with a wide network of people (Succi & Canovi, 2020).

The COVID-19 global pandemic that began in late 2019 dramatically increased these shifts and needs. Suddenly, in order to inhibit the spread of the virus, institutions of higher education all over the world closed their physical spaces, forcing millions of people who had been working and learning in traditional, face-to-face environments, to transition to completely remote settings. This required many of them to hastily learn how to work, communicate, and collaborate using online tools in ways they had not previously

done. Dalhousie University was one of these institutions. In the Fall 2020 semester, nearly all of the University's approximately 20,000 students, the large majority of whom were enrolled in face-to-face programs, participated in their courses in an online environment (Dalhousie University, n.d.a). As a student in the Master of Information program, I was personally affected by this transition. There were many aspects of shifting to an online learning environment that caused me and my fellow students to feel trepidatious, including the daunting idea of managing group assignments without opportunities to meet our group members in person. Although research indicates that face-to-face students (i.e., those who choose a face-to-face degree program) are generally more favourably disposed to working with others than online students, the group work experiences of involuntary online students, defined here as face-to-face students forced into online learning due to circumstances outside of their control, had not been substantially investigated. In addition to my personal investment in this topic as a student, my perspective as a former secondary school teacher and administrator with more than a decade of professional experience contributed to my interest in pursuing this area of research. I have long been a proponent of cooperative learning in my own practice and in my work mentoring and coaching other secondary teachers, and I believe in the power of purposefully designed and facilitated learning experiences to foster students' critical and creative thought and expression.

Of particular interest in deciding to pursue this research was how the online environment might affect university students' beliefs and perceptions of success in creative group processes, which are defined in this study as the communicative and collaborative processes groups undertake for the purpose of arriving at novel and useful

solutions to assignment tasks. Research has shown that people produce more novel ideas when working alone than when working with others; however, people working with others often report feeling more satisfied with the outcome of their idea generation process than people working alone (Chang, 2011; Henningsen & Henningsen, 2013; Nijstad et al, 2006; West, 2002). While synchronous, face-to-face group creativity, as well as asynchronous, online group creativity, have both been studied, little is known about the ways in which student groups forced to collaborate solely through online means choose to carry out creative processes, and the factors that may affect their feelings of success.

Educational institutions may benefit from the practical and theoretical contributions of this research, as students' experiences and satisfaction are typically key measures of a university's success. For example, as part of the strategic planning process, Dalhousie University (2019b) has identified key priorities related to the student experience, including strengthening the student experience overall and enhancing the student focus of program offerings. Furthermore, many universities use a system of student evaluations of teaching and courses, such as the Student Ratings of Instruction used at Dalhousie University, to inform important curricular and instructional decisions (Dalhousie University, n.d.b). Although a vaccine has been successfully developed and a future free of COVID-related restrictions seems to be on the horizon, the circumstances surrounding the current global pandemic may very well lead to a fundamental, persistent change in the ways we work and learn with others. Gaining a deeper understanding of university students' preferences, beliefs, and perceptions of success in creative group processes in an online educational environment could help instructors and students plan

and carry out online creative group work more effectively in the future, and could also help universities better understand and meet the needs of their students. In addition, research focused on developing an understanding of the ways in which context and conditions affect the individual university student's experiences engaging in creative group processes in an online environment can contribute to the bodies of research concerning information science, education, groups, and creativity.

1.2 Research Questions

This study focused on the preferences, beliefs, and perceptions of involuntary online university students regarding group work and group creativity in an online educational environment. The research questions that guided this study were as follows:

RQ1: What are the preferences and beliefs of university students regarding group work and creative group processes?

RQ2: How do university students engaged in group work participate in creative group processes in an online environment?

RQ3: Are there specific factors that influence university students' perceptions of success in creative group processes in an online environment?

For the purposes of this study, university students are defined as undergraduate or graduate students enrolled in university with either a full- or part-time status. Group work is defined as an assignment requiring at least two students to work together to create an assignment deliverable.

1.3 Research Contributions

By conducting interviews and gathering survey responses from students enrolled in online undergraduate and graduate courses at Dalhousie University in the Fall 2020

semester, and synthesizing findings with those of prior research, this study has identified university students' preferences, beliefs, and perceptions concerning group work and creative group processes in an online environment. A blended theoretical framework has emerged, illustrating the significance of the interaction of social presence, cognitive presence, teaching presence, and agency, as well as the influence of multiple layers of context, on an individual student's experience engaging in creative group processes in an online environment. As explained in Chapter 3 below, four theoretical constructs have informed the current study: social constructivism (Creswell & Poth, 2018), Sensemaking (Dervin, 1998; 1999), the Community of Inquiry framework (Garrison et al., 2000; 2010), and the Social Cognitive Theory of Agency (Bandura, 2000). This study has shown that a blended framework incorporating central elements from each of these four constructs allows for the development of a more complete understanding of students' experiences participating in creative group processes in an online environment than any of these constructs alone. This blended theoretical framework, along with overall findings from this study, also points to the increased significance of the course instructor in an online environment, especially their responsibility for creating conditions that foster creativity through purposefully designed and thoughtfully facilitated group assignments.

1.4 Thesis Overview

This thesis comprises six chapters. Following this introductory chapter, Chapter 2 serves to provide a review of relevant literature concerning groups, creativity, and education, and concludes with a section identifying apparent gaps in the literature that have motivated this research study. The third chapter justifies the use of a mixed-methods approach for this study and explains the four theoretical constructs that have framed and

informed this research. Chapter 3 also provides an explanation of the research design for this study, including the development of two data collection instruments, the recruitment and data collection processes, steps taken to ensure data was appropriately and ethically collected and stored, and methods of analysis. The following chapter, Chapter 4, elucidates findings from the analysis of data gathered from the two data collection instruments as they relate to each of the three guiding research questions, and provides a comparison summary of results for each research question. In Chapter 5, the findings are synthesized and discussed by situating them within the context of the prior empirical and theoretical research included in the second and third chapters. In addition, the new blended theoretical framework for understanding an individual student's experience engaging in creative group processes in an online environment mentioned above is explained in detail. Finally, the thesis concludes with Chapter 6, which explains theoretical and practical contributions of this research, limitations, and suggestions for future research.

Chapter 2: Literature Review

This chapter provides a review of the literature concerning the central themes and research questions that have guided this study. In section 2.1, an overview of the scope of the literature review is explained, along with search strategies and measures taken to narrow and refine search results. Section 2.2 focuses on the most relevant literature regarding groups, especially information seeking and information sharing practices, as well as research specific to virtual groups. The next section, 2.3, brings together the most pertinent research concerning both individual and group creativity. Section 2.4 focuses on key literature about group work and creativity in education, and specifically deals with the role of course instructors in fostering group creativity and students' perceptions of group creativity and group work in general. The chapter concludes with section 2.5, an examination of gaps in the literature that have shaped the scope of the current study.

2.1 Overview

While there has been a recent surge of interest in online communication, collaboration, and learning due to the current COVID-19 global pandemic, these areas of research, along with the other areas included in this study, are far from new. There are vast bodies of literature concerning the topics of groups, creativity, and online collaboration and learning, each of which have been researched in isolation as well as in combination. Indeed, each of these topics and combinations of topics have been studied from multiple disciplinary perspectives, including information science, education, business and management, psychology and neuroscience, and social psychology.

To accomplish a feasible literature review for the current research study, a search strategy was devised that included the use of several key databases, filtering to return recently published results, as well as citation mining. In addition to searching within several general databases of scholarly literature, prominent information science and education databases were also used in order to focus on locating peer-reviewed sources most relevant to the current study. Another tactic employed to ensure relevancy was the use of filtering by publication date. Results were generally limited to the last 20 years (2000 to 2020); however, key foundational works written more than 20 years ago, primarily discovered through citation mining, were also included in the literature review. The majority of the selected education-related literature concerns research conducted in post-secondary settings, as the level of student autonomy and development, along with the nature of instruction, are quite different than in primary or secondary school settings. Similarly, selected literature related to groups and/or creativity was narrowed to primarily include studies involving post-secondary students or employees in the workplace. While many individual studies have been included, there are also several systematic literature reviews and meta-analyses incorporated in this literature review. The inclusion of these sources assisted in developing an overall understanding of key findings and major trends in the research. Theoretical works that have informed the current study, some of which are referenced in the literature review and others of which are described in Chapter 3 of this thesis, have also been selected based on their relevancy to the research questions for this study and their prior application in similar studies, many of which have been included in this review of literature.

2.2 Groups

As mentioned in Chapter 1, groups are essential components of modern educational and professional work. In tasking people to work in groups, organizations often expect multiple processes to take place with varying degrees of external constraints and supports. As Kozlowski and Bell (2003) explained:

> Groups…exist to perform organizationally relevant tasks, share one or more common goals, interact socially, exhibit task interdependencies (i.e., workflow, goals, outcomes), maintain and manage boundaries, and are embedded in an organizational context that sets boundaries, constrains the team, and influences exchanges with other units in the broader entity (p. 334).

As McGrath et al. (2000) stated, "groups include three types of elements: a) people who become a group's members, b) intentions that are embodied in group projects, and c) resources that comprise the group's technologies" (p. 98). In order to achieve their intentions, groups must effectively manage many processes, including the generating, seeking, and sharing of ideas and information (Akkerman et al., 2007; Al-Samarraie & Saeed, 2018; Dahlin et al., 2005; Fidel et al., 2004; O'Farrell & Bates, 2009; Poltrock et al., 2003; Shah & Gonzalez-Ibanez, 2011; Toze, 2014). The dynamic, complex nature of group work can make it difficult to isolate specific group processes (Fidel et al., 2004; Toze, 2014); however, there are several key findings that can be applied to the current study.

2.2.1 Information Seeking and Sharing in Groups

Information seeking and information sharing are especially important processes for student groups. Dervin (1999) defined information as a "structural representation and

at the same time as something that the human species, because of the discontinuity mandate in the human condition, makes and then challenges and unmakes and remakes as events move forward" (p. 738). As students are not yet considered experts in their fields, they typically must include information from scholarly sources in their assignments, while also contributing their own constructs of information as part of a group's work. Collaborative information seeking, even when done asynchronously and remotely, has been shown to lead to the discovery of more and better results than information seeking performed by the same number of individuals working alone (Gonzalez-Ibanez et al., 2011; Shah & Gonzalez-Ibanez, 2011). According to O'Farrell and Bates (2009), university students engaged in group projects typically work independently to seek information sources but collaborate often when sharing information. Many professional groups, however, such as designers and engineers, are more likely to seek information collaboratively (Fidel et al., 2004; Poltrock et al., 2003). Regardless of their information seeking practices, members of both student and professional groups spend a substantial amount of time communicating with each other, and groups' social interactions have been shown to be intertwined with information processes (Fidel et al., 2004; O'Farrell & Bates, 2009; Toze, 2014).

Research has demonstrated that a group's success is closely connected to their ability to effectively share information, which is affected by internal and external factors (De Dreu et al., 2008; Mesmer-Magnus & DeChurch, 2009; Steinel et al., 2010; van Ginkel & van Knippenberg, 2009). People tend to readily share relatively inconsequential information while holding on to more important information, often leading to suboptimal or poor decision-making (Balau & Utz, 2016; De Dreu et al., 2008). In their meta-

analysis of information sharing and group functioning, Mesmer-Magnus and DeChurch (2009) explained, "teams share more information when (a) all members already know the information (biased information sampling), (b) members are all capable of making accurate decisions independently (informational independence), and (c) members are highly similar to one another (member similarity)" (p. 543). In addition, a group's awareness of the specific knowledge held by other members of the group (Scholten et al., 2007; van Ginkel & van Knippenberg, 2009), group diversity (van Knippenberg et al., 2004) and trust and social dynamics within the group (Balau & Utz, 2016; De Dreu et al., 2008) affect their information sharing behaviours. Research has shown that information sharing (and withholding) can also be a strategic behaviour employed to manipulate power within a group (de Vreeze & Matschke, 2017; Steinel et al., 2010).

2.2.2 Virtual Groups

The development of the internet and associated collaborative technological tools has allowed organizations to bring together people from disparate backgrounds living far from each other to create virtual work groups. Virtual groups carry out processes, such as "planning, communicating, coordinating, decision making, and leading," (Tannenbaum et al., 2012, p. 10) synchronously and asynchronously using a variety of technological tools (Adamczyk & Twidale, 2007; Al-Samarraie & Saeed, 2018; Tannenbaum et al., 2012). In their comprehensive literature review of challenges and barriers in virtual groups, Morrison-Smith and Ruiz (2020) identified various factors affecting virtual groups that are not typically present in co-located groups, such as geographic distance, temporal distance (e.g., time zone differences), and perceived distance, which is "the 'symbolic meaning' of proximity rather than physical proximity" (p. 11). According to Adamczyk

and Twidale (2007), collaborative technological tools, such as online word processing software (e.g., Google Docs) are especially useful for multidisciplinary student groups and can help students manage complex group processes and potentially mitigate some of the common challenges faced by virtual groups. For example, groups can create an atmosphere of closeness through the use of synchronous video conferencing tools (Morrison-Smith & Ruiz, 2020). Al-Samarraie and Saeed (2018) found that the use of synchronized online tools is beneficial in engaging students in collaborative work, particularly the idea generation and reflection processes. Collaborative technological tools also allow for groups to more easily view changes and progress made by individual members, which enables groups to avoid completing redundant tasks and thus work more efficiently than they may have otherwise (Al-Samarraie & Saeed, 2018; Brown & Thomas, 2020; Tannenbaum et al., 2012), but can also lead to feelings of being surveilled and an atmosphere of distrust (Al-Samarraie & Saeed, 2018; Blau & Caspi, 2009). For example, in their study of student groups' collaboration using Google Docs, Blau and Caspi (2009) found that students felt distrustful when others in their group edited text they had written, preferring instead to receive suggestions in the form of comments that they could then approve or reject.

Virtual group communication is inherently different than face-to-face group communication. Although internet communication technologies are often part of group work for both co-located and virtual groups, such modes typically supplement face-to-face communication for co-located groups but are the sole means of communication for virtual groups (Morrison-Smith & Ruiz, 2020). With the exception of synchronous video calls, most virtual group communication is text-based. As Garrison et al. (2000) noted,

"oral communication tends to be fast-paced, spontaneous, and fleeting" (p. 90), and includes nonverbal cues that cannot be replicated in text form. While written online communication is not as rich as oral, face-to-face communication, there are some potential advantages to this medium, such as allowing time for reflection (Garrison et al., 2000). The lack of nonverbal cues of written online communication can also cause people to be less concerned with the perceptions or judgement of others, and therefore more open to sharing information and ideas (Code, 2013; Saghafian & O'Neill, 2018).

2.3 Creativity

Creativity is a somewhat elusive concept. Since the 1950s, academics from a variety of disciplines have been attempting to define and understand creativity. E. Paul Torrance (1966), one of the first leaders in creativity research, defined creativity as:

> a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies: testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results (as cited in Kim, 2006, p. 3).

Another leader in the field of creativity research, Mihaly Csikszentmihalyi (1996), explained that "creativity results from the interaction of a system composed of three elements: a culture that contains symbolic rules, a person who brings novelty into the symbolic domain, and a field of experts who recognize and validate the innovation" (p. 6). A colleague of Csikszentmihalyi, David Feldman (1994), defined creativity as "the purposeful transformation of a body of knowledge, where that transformation is so significant that the body of knowledge is irrevocably changed from the way it was

before" (p. 86). On a more practical scale, creativity can be defined as "the generation of novel and useful ideas" (Gong et al., 2009, p. 765; Zhang et al., 2018, p. 1966). While definitions vary greatly, there is consensus that creativity is complex. As a result of this complexity, Zeng et al. (2011) stated, "a definition of creativity should depend on specific research interests" (p. 25).

2.3.1 Individual Creativity

Individual creativity has been shown to occur under a variety of circumstances and with a diverse range of influential factors (Csikszentmihalyi, 1996; Dijksterhuis & Meurs, 2006; Gong et al., 2009; Kim, 2006; Zhang et al. 2018; Zhou & George, 2001). Csikszentmihalyi (1996) argued that humans' need for and appreciation of creativity is innate, in that people typically report finding the most enjoyment from discovering or designing new things, regardless of their general interests or backgrounds. Research has indicated that people tend to have more creative ideas when they engage in unconscious thought, as opposed to focused, intentional attempts at creative idea generation (Dijksterhuis & Meurs, 2006). An individual's personality, contextual factors, and the interaction between the two, have been shown to influence their creative output (Shalley et al., 2004). Several studies included the influence of other people as a potential factor that shapes an individual's creativity (Gong et al., 2009; Zhang et al., 2018; Zhou & George, 2001). In a study measuring employees' perceptions of creativity and support, Zhou and George (2001) found that job dissatisfaction can lead to higher levels of creativity under certain conditions: specifically, when an employee is committed to keeping their job and also receives useful feedback from colleagues. Studies by Gong et

al. (2009) and Zhang et al. (2018) both found that inspiring, motivational leaders can influence individuals to be more creative over time than they would be otherwise.

2.3.2 Group Creativity

Like studies of individual creativity, group creativity research has attempted to identify how creative group processes occur, and the conditions that impact those processes. Most often, group creativity has been examined by studying groups' idea generation processes, during which groups consider a common problem and attempt to generate potential solutions (Diehl & Stroebe, 1987; Diehl & Stroebe, 1991; Miller, 2009; Nijstad et al., 2006; Rietzschel et al., 2006; Henningsen & Henningsen, 2013). One of the first to consider this topic was advertising executive Alex Osborn, who, in 1953, published his influential (but not research-based) book, *Applied Imagination*, which extolled the virtues of brainstorming, "a conference technique by which a group attempts to find a solution for a specific problem by amassing all the ideas spontaneously by its members" (Runco & Pritzker, 1999, p. 220). Despite Osborn's assertions, research has consistently shown that groups engaged in brainstorming generate fewer ideas, and fewer good ideas, than individuals generating ideas alone and then combining their ideas later, also known as nominal groups (Diehl & Stroebe, 1987; Diehl & Stroebe, 1991; Miller, 2009; Nijstad et al., 2006; Rietzschel et al., 2006; Henningsen & Henningsen, 2013). Various factors have been demonstrated to be partially responsible for this phenomenon, including free riding, which occurs when a member of a group relies on others to contribute ideas; evaluation apprehension, the fear of being judged for contributing an idea that could be viewed as 'bad' by others in the group; production blocking, which occurs when one member of a group inhibits others from contributing; and idea fixation,

the tendency for groups to focus on ideas held in common and to avoid voicing divergent ideas (Diehl & Stroebe, 1987; Diehl & Stroebe, 1991; Paulus & Nijstad, 2003). Notwithstanding evidence to the contrary, people still tend to believe that group brainstorming is more effective than working alone, possibly due in part to the fact that groups are less likely than individuals to experience a complete failure to generate any ideas (Nijstad et al., 2006). In addition, brainstorming groups have been shown to be just as successful as nominal groups in selecting high-quality ideas from those generated by the group, and to be more cohesive than nominal groups, which suggests that productivity is not necessarily the most essential component of a group's creative success (Rietzschel et al., 2006; Henningsen & Henningsen, 2013).

There are many other factors that have been shown to influence group creativity, such as group diversity, group leadership, and the values and abilities of group members (Choi et al., 2019; Hulsheger et al., 2009; Lee et al., 2015; Levine et al., 2016; Oztop et al., 2018; Pi et al., 2018; West, 2002). Findings concerning the overall effects of group diversity on group performance have been mixed (e.g., Dahlin et al., 2005; van Knippenburg et al., 2004). While some studies have indicated that group diversity can assist in creative group processes (Lee et al., 2015; Levine et al., 2016; West, 2002), Paulus and Nijstad (2003) point out that, "for diversity to have positive effects on creativity it is necessary that group members share their diverse perspectives" (p. 6). As mentioned above, groups often focus on ideas they have in common, which can mitigate the positive effects of group diversity. In a study of group creativity in an asynchronous online environment, Coursey et al. (2018) found that political or value-based diversity can assist group creativity, but age and gender diversity are often related to a lower level

of group creativity. Just as with individual creativity, group creativity can be positively affected by factors related to leadership. Lee et al. (2015) found that shared leadership, "a voluntary, informally emergent structure beyond vertical leadership" (p. 47), positively contributes to group creativity. Similarly, the values, mindsets, and psycho-social abilities of group members contribute to a group's creativity. According to Oztop et al. (2018), closeness, "the perceived connectedness or interconnectedness of self and other" (p. 267), leads to higher group creativity, while groups whose members have strong perspective-taking abilities are less creative. This aligns with findings mentioned above related to the negative effects of idea fixation, in that people who more easily take on the perspectives of others are less likely to have and/or voice divergent thoughts when working with a group (Paulus & Nijstad, 2003). Choi et al. (2019) found that the most creative groups consist of people who have collectivistic values (i.e., valuing the group and community over the individual), but who also demonstrate independent self-representation (i.e., having a stable view of oneself regardless of context).

External factors, as well as the procedures by which groups carry out their work, also impact group creativity (Breslin, 2019; Chang, 2011; Michinov & Primois, 2004; Sousa et al., 2014; West, 2002). Although external threats or demands can lead to the need for group innovation, research has shown that groups are more creative when they feel safe and free from pressure (West, 2002). In addition, groups have been shown to be significantly more creative when engaging in idea generation around midday as opposed to morning or afternoon (Breslin, 2019). Research has indicated that asynchronous, web-based group idea generation can lead to more and better ideas than face-to-face group idea generation, as long as group members are informed of each other's contributions in a

centralized way (Michinov & Primois, 2004). For example, Michinov and Primois (2004) found that a shared table updated with each group member's contributions along with feedback from a facilitator allowed groups to produce more ideas and more creative ideas than groups that did not use a shared table. In addition, virtual groups with structured, mediated interactions have been shown to perform better than other types of virtual groups and face-to-face groups (Chang, 2011; Sousa et al., 2014).

2.4 Education

The thoughtful, purposeful use of group assignments in education has been shown to improve student learning and community knowledge building (e.g., Colbeck et al., 2000); however students often report dissatisfaction with aspects of group assignments (e.g., Burdett, 2003). As explained below, research has suggested that realization of the potential benefits of group work is conditional, and that positive student perceptions of group work and group creativity are partially dependent on appropriate guidance and support from instructors (e.g., Shimazoe & Aldrich, 2010).

2.4.1 Role of Instructors

When university instructors take steps to promote creative group processes and facilitate collaboration, such as explicitly teaching interpersonal and group work skills, establishing clear structures and expectations, facilitating the setting of group norms, helping groups manage conflict, promoting social connectedness, and encouraging reflection, student groups are more successful (Bernier & Stenstrom, 2016; Burdett, 2003; Carter et al., 2018; Colbeck et al., 2000; Pragnell et al., 2006; Shimazoe & Aldrich, 2010; Whatley, 2009). Research has indicated that learning outcomes and student satisfaction improve when students engaged in group projects receive instruction on how

to effectively approach collaboration and group communication (Burdett, 2003; Carter et al., 2018; Colbeck et al., 2000; Shimazoe & Aldrich, 2010). Not only have structured, mediated group interactions been shown to positively impact group creativity (Chang, 2011; Sousa et al., 2014) they can also assist in the development of cohesive, successful groups (Carter et al., 2018; Colbeck et al., 2000; Pragnell et al., 2006). Instructor support in establishing ground rules and intervening in the event of conflict has also been shown to be beneficial to student groups (Bernier & Stenstrom, 2016; Shimazoe & Aldrich, 2010; Whatley, 2009), and students have reported a desire for more instructor support in developing productive relationships with group members (Burdett, 2003; Carter et al., 2018).

While instructors in both face-to-face classrooms and online learning environments can support creative group work in similar ways, there are additional elements that apply to online courses. As Draper (2015) explained, "converting traditional face-to-face courses to the online environment requires the instructor to re-envision course learning activities and assessments" (p. 123). A key aspect of online instruction is the promotion of social presence, which can be defined as "the ability of participants … to project their personal characteristics into the community, thereby presenting themselves to the other participants as 'real people'" (Garrison et al., 2000, p. 89). Though it can be difficult to ensure each student in an online class experiences social presence, research indicates that it is essential for successful online learning, and that lack of social presence can lead to student frustration and decreased learning (Draper, 2015; Garrison et al., 2010; Stodel et al., 2006; Sung & Mayer, 2012; Wei et al., 2012). One method of encouraging social presence can be to limit group size, as members of smaller

groups have been shown to contribute more than members of larger groups, which often leads to better group outcomes (Chidambaram & Tung, 2005). Another method is by modeling appropriate teaching presence by engaging with students to a moderate degree through course communication tools, such as discussion boards (Larson et al., 2019). The use of problem-based assignments, such as those that involve design thinking and/or experiential learning, has also been shown to contribute positively to group creativity (Lee et al., 2019; Lloyd, 2012). Research has also indicated that the skills required to successfully engage in online group work, such as online collaboration and group scheduling, are significantly different than those required in face-to-face group work, and may need to be explicitly taught to students unfamiliar with online group work (Saghafian & O'Neill, 2018). There is substantial evidence to show that, with thoughtfully created structure and appropriate facilitation, online learning environments can be more conducive to group creativity and collaborative learning than face-to-face classrooms, especially for students with learning difficulties and students for whom the language of instruction (e.g., English) is not their native language (Chang, 2011; Delaney et al., 2019; Kim et al., 2019; Kop & Carroll, 2011; Pragnell et al., 2006; Sousa et al., 2014; Stahl, 2006).

2.4.2 Students' Perceptions and Attitudes

Student perceptions and attitudes also play a part in the success of groups in carrying out creative processes in an online learning environment. General perceptions of group work among university students are somewhat mixed, though research has indicated that university students generally prefer not to take part in group assignments (Colbeck et al., 2000; Shimazoe & Aldrich, 2012). Positive student perceptions of group

work include the belief that working with others can facilitate the generation of ideas, potentially improve learning and grades, allow them to get to know and understand others, and lighten their own workload (Burdett, 2003; Colbeck et al., 2000). However, university students often report frustration and resistance to group work, typically due to difficulties related to inefficient use of time, unequal distribution of effort, discomfort with their grades being partially dependent upon the work of others, and a lack of support from their instructors (Burdett, 2003; Colbeck et al., 2000; Shimazoe & Aldrich, 2010). Research has indicated that students' perceptions are based on their past experiences, and that the success of these experiences is largely dependent upon the actions of their course instructors, as explained above (Bernier & Stenstrom, 2016; Burdett, 2003; Colbeck et al., 2000; Shimazoe & Aldrich, 2010).

Differences between university students who choose a face-to-face program and those who choose an online degree program include attitudes about working with others, preferred learning methods, levels of intrinsic motivation, tolerance for risk, beliefs in the importance of sense of community, and perceptions of the learning environment (Beadles & Lowery, 2007; Haigh, 2007; Mullen & Tallent-Runnels, 2006; O'Neill & Sai, 2014; Pentina & Neeley, 2007; Wighting et al., 2008). Fac-to-face students are most likely to prefer learning in a sensory manner (i.e. they prefer to perceive information in the form of sounds, sights, and physical sensations) and generally have a higher preference for working with others than online students, who typically prefer learning in an intuitive manner (i.e. they prefer to perceive information in the form of memories, ideas and insights) and have a stronger preference for working alone (Beadles & Lowery, 2007; Haigh, 2007; Pentina & Neeley, 2007; Wighting et al., 2008). Online students have been

found to generally have higher levels of intrinsic motivation, while face-to-face students often place a higher value on sense of community and depend more heavily on classroom participation and interactions with peers and instructors to stimulate their learning (Haigh, 2007; Pentina & Neeley, 2007; Wighting et al., 2008). Students who choose face-to-face programs generally have a lower tolerance for risk than online students, believe they will be better able to monitor their own learning in face-to-face courses than in online courses (O'Neill & Sai, 2014), and tend to believe online courses are less likely to fulfill learning objectives and less likely to be worth the financial cost than face-to-face courses (Haigh, 2007; Pentina & Neeley, 2007). Another key difference between face-to-face and online students is their perceptions of instructor support and demands. According to Mullen and Tallent-Runnels (2006), as compared to online students, face-to-face students report perceiving higher levels of affective support from instructors, which "demonstrates to students that instructors care through listening, encouraging students to share ideas, using personal examples, and providing humor" (p. 263). However, perceived affective support is more important for online students than it is for face-to-face students, in that it is more closely correlated with overall course satisfaction for the former population than the latter.

2.5 Gaps in the Literature

Although immense bodies of literature exist concerning the topics detailed above, there appear to be several noteworthy gaps in the existing research. First, significant research has not been undertaken to study the beliefs and perceptions of face-to-face students forced into online group work, simply because an event like the current COVID-19 global pandemic is unprecedented in modern history. This topic is important to

understand, however, as it seems likely institutions will offer more courses in an online or blended format after COVID-related restrictions are lifted than they did previously, which could lead to a greater number of face-to-face students enrolling in these types of courses in the future, either voluntarily or because they would like or need to take courses that have been deemed better delivered in an online format. Second, much of the extant literature concerning students' experiences engaging in online courses and online group work in education focuses on fostering social presence and the ways in which instructors can support learning, but does not seem to typically address aspects of power and agency between and among students, especially as they relate to an individual student's experiences within multiple contexts, including factors related to the group context, the online context, and the course and institutional contexts. Third, although there are many studies focused on face-to-face and online students' experiences and beliefs, factors that influence students' perceptions and definitions of success in creative group work in an online environment have not been thoroughly explored. Group creativity studies tend to focus on the quantity and quality of ideas generated as a measure of a group's creative success, often ignoring or downplaying other measures, such as the group's ability to meet external requirements in an efficient manner, that could seem more significant to members of student groups in determining their feelings of success.

Chapter 3: Methodology

This chapter outlines the methodology of this study. Section 3.1 provides an overview of the rationale for a mixed-methods approach. In section 3.2, the four theoretical constructs that have shaped the research design and data analysis of this study are explained, as well as justifications for using each of the constructs. Section 3.3 details the research design, including the creation of the two data collection instruments (a semi-structured interview script and a survey), as well as the recruitment processes and selection criteria for participation. This is followed by section 3.4 in which steps for data collection and secure data storage are explained. The next section, 3.5, details the distinct processes of analyzing data collected via the survey instrument and from the semi-structured interviews. Section 3.6 covers the steps taken to ensure validity and reliability throughout the data collection and analysis processes. Section 3.7 describes the process of securing ethics approval from Dalhousie's Social Sciences and Humanities Research Ethics Board, and section 3.8 explains the use of participant IDs in the subsequent sections of the paper to distinguish between participants while maintaining anonymity. A summary of the methodology is provided in section 3.9.

3.1 Overview

In their systematic review of literature concerning group work in higher education, Riebe et al. (2016) suggested that "future research should look to employ methods that are capable of capturing more nuanced interactions, such as mixed-methods designs, which are focused on addressing macro- and microlevel dimensions of social phenomena" (p. 641). According to Creswell (2006), mixed methods research can

compensate for weaknesses in quantitative research, such as lack of contextual information, as well as weaknesses in qualitative research, such as subjectivity and difficulty generalizing findings, through the use of both methods in tandem, which can "provide a better understanding of research problems than either approach alone" (p. 5). In addition, Dervin (as cited in Shenton & Hay-Gibson, 2012) noted "the necessity of obtaining a variety of perspectives in order to get a better, more stable view of 'reality' based on a wide spectrum of observations from a wide base of points in time-space" (p. 101). As such, a mixed methods approach, consisting of a survey questionnaire and semi-structured interviews, was employed in this study in order to gain a thorough understanding of the preferences, beliefs, and perceptions of university students engaged in creative group processes in an online educational environment, and was essential in gaining a deeper understanding of the research questions posed in this study than would have been possible using quantitative or qualitative methods alone.

3.2 Theoretical Constructs

There are four key theoretical constructs that have informed the current study: social constructivism, Sensemaking, the Community of Inquiry model, and the Social Cognitive Theory of Agency. As this research is interdisciplinary in nature and draws from prior research in social psychology, information science, and education, a combination of theoretical constructs was necessary to arrive at a fuller understanding of potential answers to the research questions. Each theoretical construct offered a different essential lens through which to consider study design and/or data analysis; in combination, they allowed for a holistic approach to searching for an inclusive

understanding of the many factors that influence university students' preferences, beliefs, and perceptions concerning creative group work in an online educational environment.

3.2.1 Social Constructivism

The first of these theoretical constructs was the social constructivist interpretive framework laid out by Creswell and Poth (2018). Using a social constructivist lens, the study was planned to allow for the multitude of ways in which "individuals seek understanding of the world in which they live and work" (Creswell & Poth, 2018, p. 24). The social constructivist paradigm has been used in a variety of social science and educational research, including several studies incorporated in the literature review for this study (e.g., Kim et al., 2019; Riebe et al., 2016; Stodel et al., 2006) and provided an overarching perspective from which to consider study design. Social constructivism was a useful framework by which to study the complex, dynamic concepts of creativity and group processes in that it recognizes the importance of individuals' subjective interpretations as well as the influences of their interactions with others (Creswell & Poth, 2018). In social constructivism, reality is not fixed, but is instead dependent on a person's interpretation of events and interactions. According to Davis et al. (2017), when applied to the study of education, social constructivism "suggests that successful … learning is heavily dependent on interpersonal interaction and discussion" (p. 67). As the current study was focused on learning more about the ways in which students perceive and construct their own understanding of success in carrying out creative group processes online, a social constructivist framework was used to guide the creation and design of the quantitative and qualitative data collection instruments.

3.2.2 Sensemaking

The research design and approach to data analysis were also informed by Dervin's (1998;1999) Sensemaking metatheory. Sensemaking has been used in previous groups research, especially in studies of organizational culture, as well as groupthink, which is similar to idea fixation, and can be defined as the psychological phenomenon that occurs when members of a group come to a consensus without fully considering the possible range of diverse or divergent ideas, typically with negative consequences (Harris, 1994; Henningsen et al., 2006). According to Dervin (1998), Sensemaking focuses on the sense made at a "particular point in time-space by someone" (p. 36) and applies a central metaphor of "human beings traveling through time-space, coming out of situations with history and partial instruction, arriving at new situations, facing gaps, building bridges across those gaps, evaluating outcomes and moving on" (p. 39). Rather than viewing people as predictable with a standard set of needs, Sensemaking recognizes the temporary quality of information and knowledge, and the complex factors that influence behaviour in any given context (Dervin, 1998). Sensemaking was a particularly useful construct to apply to the current study in that it helped elucidate the ways individuals made sense of the complex processes involved with group work, and how they understood their own perceptions and beliefs to have interacted with the sense made by others in their groups.

3.2.3 Community of Inquiry

The third theoretical construct, the Community of Inquiry (CoI) model, was developed relatively recently as a response to the rise of online instruction and is now widely used to study the online student experience (Garrison et al., 2010; Garrison et al., 2010; Stodel et al., 2006). The CoI model, which is "collaborative-constructivist"

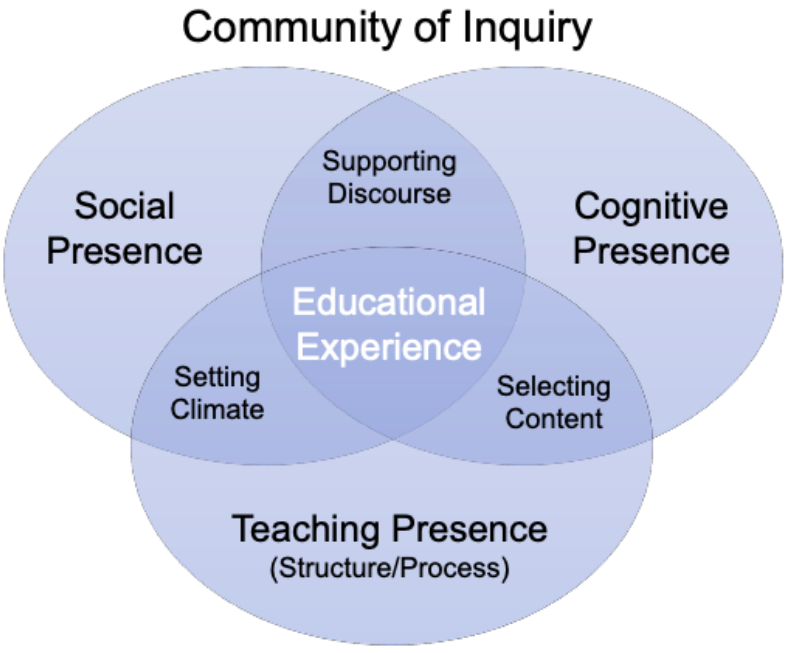
(Garrison, 2009, p. 352) in nature, posits that the interaction of three central elements; cognitive presence, social presence, and teaching presence; creates a worthwhile educational experience (Garrison et al., 2000). As Garrison et al. (2000) noted, successful learning "must consider the learner's personal world (reflective and meaning focused) as well as the shared world (collaborative and knowledge-focused)" and that in an educational experience "collaboration is seen as an essential aspect of cognitive development since cognition cannot be separated from the social context" (p. 92). In the CoI model, cognitive presence refers to the extent to which students construct meaning through seeking information, exploring ideas, and interacting with each other (Garrison et al., 2001). As explained above, social presence is the ability of students to convey their sense of self to others and establish shared social identity within the community (Garrison, 2009), while teaching presence refers to the structures and processes instructors provide for students through the design and facilitation of learning activities and the learning environment (Garrison et al., 2000). As illustrated in Figure 1 below, in a Community of Inquiry, a student's educational experience is shaped by the intersection of these three types of presence.

Over the past twenty years, researchers attempting to evaluate the CoI framework have proposed different modifications based on empirical evidence (Castellanos-Reyes, 2020). These include the addition of emotional presence to recognize the affect of a student's feelings on their online educational experience (Cleveland-Innes & Campbell, 2012), learning presence to account for the "attitudes, abilities, and behaviors that active and engaged students bring to their individual and collaborative online activities" (Shea et al., 2014, p. 10), or autonomy presence to include the influence of the individual's

independence and freedom (Lam, 2015). These suggested revisions have been neither validated nor adopted by the research community, as researchers have typically found these elements are already accounted for within the three original types of presence to the extent to which they are necessary (Castellanos-Reyes, 2020). In addition, researchers have argued that social presence is more important in a Community of Inquiry than cognitive or teaching presence and that its visual representation within the model should be changed to demonstrate its significance (Armellini & De Stefani, 2016). This idea, however, has not led to a revision of the model but has contributed to refinements in the definition of social presence to emphasize the importance of developing a shared social identity (Castellanos-Reyes, 2020). As such, the CoI model first devised by Garrison et al. in 2000 remains a widely accepted and mostly unchanged model for understanding a student's online educational experience.

Figure 1

Community of Inquiry Model (Garrison et al., 2000, p. 88)



The CoI model was especially salient to the current study in that cognitive, social and teaching presence have been shown to be vital components of student success in an online educational environment (Draper, 2015; Garrison et al., 2010; Stodel et al., 2006; Sun & Mayer, 2012; Wei et al., 2012). The CoI model allowed for the identification and analysis of cognitive, social, and instructional factors that contributed to students' perceptions of success in group creativity in an online environment and the overlapping effects of factors in each category, and has informed the development of the coding scheme used to analyze qualitative data.

3.2.4 Social Cognitive Theory of Agency

The fourth theoretical construct applied to this study is the Social Cognitive Theory of Agency (SCToA) (Bandura, 2000). Agency can be defined as "the capability for individuals to consciously choose, influence, and structure their actions in order to achieve a desired outcome" (Emirbayer & Mische, 1998; Gecas, 2003, as cited in Code, 2013, p. 39). As Bandura (2000) explained, "social cognitive theory distinguishes among three modes of agency: direct personal agency, proxy agency that relies on others to act on one's behest to secure desired outcomes, and collective agency exercised through socially coordinative and interdependent effort" (p. 1). Not only do individuals exercise personal agency within a group, but a group also makes choices collectively in accordance with shared goals (Bandura, 2000 as cited in Code, 2013). Individuals in a group may also exercise proxy agency, such as when they trust a peer to complete a task with greater skills or competency than they believe themselves to possess, or when they trust an instructor to guide them in the right direction (Bandura, 2001). As Code (2013), explained:

> Social and group interactions in learning communities develop and evolve through practices and expressions of human agency. Agency is an emergent, dynamic process through which personal control interacts with the efforts of another individual or group to promote self and communal development. (p. 47)

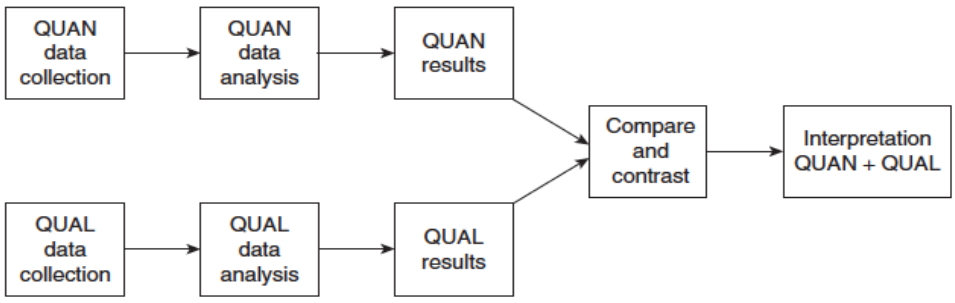
In creative group processes, agency plays a key role in that idea generation and selection have been shown to be strongly influenced by the social dynamics and power structure of the group (de Vreeze & Matschke, 2017; Diehl & Stroebe, 1987; Diehl & Stroebe, 1991; Paulus & Nijstad, 2003; Steinel et al., 2010). Along with Sensemaking and the CoI model, the SCToA has informed the coding scheme used to analyze data gathered through the semi-structured interviews, as well as the synthesis of results from the quantitative and qualitative analyses.

3.3 Research Design

As mentioned above, a mixed-methods design was applied to this study. Specifically, the convergence model (Figure 2) of Triangulation Design was employed, in that a quantitative and a qualitative instrument were used simultaneously to gather complementary data for the purpose of comparing and contrasting results during interpretation (Creswell, 2006).

Figure 2

Convergence Model of Triangulation Design (Creswell, 2006, p. 63)



3.3.1 Research Instruments

The quantitative instrument developed for this study (Appendix E) was created based on instruments used in prior research on satisfaction with group work (Chang, 2011; Henningsen & Henningsen, 2013; Nijstad et al, 2006; West, 2002) and perceptions of creativity in work settings (Zhou & George, 2001; Gong et al., 2009). The survey was designed to mostly focus on addressing RQ1 (What are the preferences and beliefs of university students regarding group work and creative group processes?) and RQ3 (Are there specific factors that influence university students' perceptions of success in creative group processes in an online environment?), as RQ2 (How do university students engaged in group work participate in creative group processes in an online environment?) was best addressed through semi-structured interviews to allow for the collection of necessarily detailed data. The survey consisted of five sections and included 29 questions in total. The first section, comprised of eight questions, asked participants to provide information concerning demographics and the program in which they were enrolled. The second section included four multiple-select questions regarding participants' experiences with face-to-face and group assignments in the past. The third and fourth sections consisted of Likert-scale questions; the third section asked participants to respond to three questions concerning their preferences about group assignments and working with others, while the fourth section included seven questions related to participants' beliefs about the same topic. The fifth section was focused on gathering data related to creative idea generation and group assignments, and included six Likert-scale questions and one final open-response question allowing participants to share any additional comments about group assignments they may have had.

The qualitative research instrument created for this study, a semi-structured interview script (Appendix F), was designed to elicit responses from participants that allowed them to share their perceptions of success in group creativity in an online environment, the factors they believed influenced their success, and the ways in which they participated in creative group processes in an online environment, and was based on instruments used in prior research on group work (Burdett, 2003; Colbeck et al., 2000; Toze, 2014). The interview script consisted of 22 open-ended questions concerning students' attitudes and opinions regarding creative group idea generation, and their experiences as members of a particular group. The first three questions asked participants to share demographic information, information about their academic program, and information about one particular group assignment in which they had participated during the Fall 2020 semester. The next five questions asked participants to share information regarding group formation, establishment of ground rules, and how well they already knew and got to know their group members over the course of completing the assignment. The next seven questions explicitly asked participants to explain their group's idea generation processes and their individual perceptions of success concerning their group's idea generation and selection. Participants were then asked to describe any disagreements or conflicts their group may have had, and then recount the technologies their group used. The following four questions asked participants to reflect on their group's overall success and cohesion, whether they believed their group valued their individual contributions, and to compare the group experience in question to other group experiences. Finally, participants were asked if they would like to share anything else with the interviewer.

3.3.2 Recruitment

Participants were recruited for both the interviews and survey using a voluntary response sample method targeting students enrolled in at least one course at Dalhousie University in the Fall 2020 semester for which a group assignment was required. As mentioned above, for the purposes of this study, a group assignment was defined as an assignment requiring two or more students to work together to create at least one group deliverable. Dalhousie University is a large, public, research-intensive university located in Nova Scotia, Canada, offering more than 200 degree programs across 13 faculties, and had a student population of approximately 20,000 at the time of this study (Dalhousie University, 2019a). As mentioned in Chapter 1, only a few of the University's programs are typically offered as completely online programs; however nearly all students took all courses online for the Fall 2020 semester due to the University's response to the COVID-19 pandemic (Dalhousie University, n.d.a).

Participants were recruited through notices sent to student listservs and email lists upon receipt of permission from program directors and course instructors, and with the assistance of Dalhousie faculty and staff. A recruitment notice intended to recruit between 12 and 15 students for the semi-structured interviews was sent to undergraduate and graduate students enrolled in the Bachelor of Commerce, Bachelor of Management, Master of Business Administration, Master of Information, and Master of Resource and Environmental Management programs in the Faculty of Management on October 22, 2020. Faculty of Management programs were selected for recruitment due to the known prevalence of group work within this faculty, and to attempt to recruit participants who were completing similar types of group assignments and thus control for differences. The

participant number range of 12 to 15 was chosen based on Guest, Bunce, and Johnson's (2006) study, which found that data saturation occurred after 12 interviews. Interview participants were compensated with a $15 Amazon.ca gift certificate. The interview recruitment notice instructed students interested in participating to email me directly; 41 students did so. Each of the 41 students was then sent an email with the interview consent document (Appendix D) and instructions for scheduling an interview. Participants were selected based on the order in which they confirmed that they had read the consent document and their availability for an interview.

A separate survey recruitment notice (Appendix A), which included an informed consent procedure and a link to the survey instrument (Appendix C), was sent via email to undergraduate and graduate student lists for the Faculty of Management, including the Bachelor of Commerce, Bachelor of Management, Master of Business Administration, Master of Information, and Master of Resource and Environmental Management programs, and the Faculty of Computer Science, as well as student lists for undergraduate and graduate programs in Psychology and Neuroscience, and Political Science. As with the interview recruitment, recruitment for the survey was first limited to students in the Faculty of Management; however, in order to cast a wider net and increase participant numbers, program directors in the Faculty of Computer Science, the Faculty of Arts and Social Sciences, and the Faculty of Science were contacted with requests to assist in recruitment. Administrators from the Faculty of Computer Science, as well as the Political Science program in the Faculty of Arts and Social Sciences and the Psychology and Neuroscience program in the Faculty of Science, were the first to respond offering their support with recruitment. The survey recruitment notice was disseminated to each

student list once between November 2 and November 6, 2020 by administrative staff members from each of the above mentioned programs. In total, approximately 4,500 students were enrolled in programs to which the survey recruitment notice was sent. Upon completing the survey, participants were given the option to submit their email address to be entered in a drawing for one of three $50 Amazon.ca gift certificates. Email addresses were collected using a separate Qualtrics survey in order to ensure participants' survey responses could not be linked with their contact information.

3.4 Data Collection

As explained above, quantitative and qualitative data were collected separately using a survey and semi-structured interviews, respectively.

3.4.1 Survey Data Collection and Participants

The survey was carried out online using Qualtrics, a secure survey software platform. Qualtrics uses an online server in Toronto Canada (with a backup in Montreal), secured using TLS/HTTPS and limits access to the data using username and password protocols. Participants were able to take the survey from anywhere in the world, though they may not have been able to participate if behind a firewall, which may have been an issue for students in some countries. After completing the consent protocol, participants were asked to respond to the survey questions described above. The survey was open for a period of two weeks, from November 2, 2020 to November 16, 2020. After excluding partial responses, there were 374 responses to the survey.

Of the 374 survey participants, 51% (191) identified as male and 46% (172) as female, with six participants identifying as another gender, and five preferring not to disclose their gender identity. Most participants (73%, 272 participants) were between the

ages of 18 and 24 years old, while 21% (80) were between 25 and 34 years old, 5% (17) were 35 years old or older, and 1% (five participants) were under 18 years of age. Forty-seven percent (177) of participants indicated they were enrolled in an undergraduate degree program and 32% indicated they were enrolled in a graduate degree program at the time of the study. Twenty-one percent (79) of participants provided information regarding their faculty or major but did not include their level of study in their response. Thirty-eight percent (143) of participants identified as international students, and 74% (278) of participants indicated that they spoke English as their primary language or one of two primary languages they used at home.

3.4.2 Interview Data Collection and Participants

Due to health and safety concerns related to the COVID-19 global pandemic, interviews were conducted remotely using Microsoft Teams. Participants and the researcher used both the audio and video features of Microsoft Teams during the interviews; however only the audio from the interviews was recorded using a digital audio recording device. Of the 41 students who were in contact to express interest in participating in an interview, 15 interviews were scheduled. One participant did not attend their interview session, and one interview did not record properly due to an unavoidable internet connectivity issue. Thirteen interviews were successfully carried out and recorded between November 4 and 13, 2020.

Of the 13 students who participated in successfully recorded interviews, six were enrolled in the Bachelor of Commerce program, two in the Bachelor of Management program, three in the Master of Business Administration program, and two in the Master of Information program. All participants were face-to-face students who had chosen to

enroll in programs typically offered face-to-face but that had transitioned to completely online delivery due to the University's response to the COVID-19 pandemic. Seven participants self-identified as female, and six as male. Nine participants were between the ages of 18 and 24 years old, while four were between 25 and 34 years old. Ten participants were Canadian citizens or permanent residents, and three were international students. Six participants reported having at least one year of full-time professional work experience, one participant had completed a semester and a half of co-op work experience, and six participants had no full-time professional work experience. The majority of participants (nine) described their experiences as part of mid-size groups consisting of four to six students. Two participants described their experiences as part of groups of two to three students, and two participants described being part of groups of seven or more students. Three students described their work on computer simulation group assignments related to running small businesses in competition with other class groups. Four students described their experiences as part of groups completing experiential assignments, all of which involved working with an outside partner organization, such as a small business or nonprofit. The remaining six participants described their experiences with group assignments concerning the creation of reports and/or presentations related to course content.

Before beginning the interview, informed consent was obtained orally (Appendix D) and recorded separately from interview responses. Participants were given an opportunity to ask questions or to choose to leave the study if they wished. The interviews then proceeded according to the interview script (Appendix F). Following the completion of each interview, audio data was transcribed using Microsoft Word.

3.4.3 Data Storage

All data were stored securely and in accordance with the procedures approved by Dalhousie's Research Ethics Board. Survey data were stored in the Qualtrics cloud server until data collection was complete, at which time it was deleted from Qualtrics. The anonymous data was stored temporarily in Dr. Conrad's Dalhousie OneDrive during analysis, then transferred to Dr. Toze's Dalhousie OneDrive for long-term storage. Access to survey data was restricted only to myself and my supervisors through our password protected Dalhousie Microsoft 365 accounts. Audio recordings of consent, interviews, transcripts, and data files were stored on Dalhousie OneDrive and restricted only to myself and my supervisors through our password protected Dalhousie Microsoft 365 accounts.

3.5 Data Analysis

According to the convergence model of Triangulation Design (Creswell, 2006), quantitative and qualitative data are first analyzed independently, and results are then compared and contrasted. As such, survey data were analyzed using descriptive statistical analysis and Pearson's correlation analysis, while interview data were analyzed using thematic analysis.

3.5.1 Analysis of Survey Data

Responses to multiple-choice, multiple-select and Likert-scale survey questions required statistical analysis, which was first completed using basic descriptive statistics in order to "summarize the general nature of the data obtained" (Leedy & Ormrod, 2015, p. 29). The 374 complete survey responses were analyzed using Microsoft Excel. Within Excel, pivot tables were used to determine counts and means for each survey question.

Counts and means were then organized into tables in order to summarize basic results from the survey. After examining descriptive statistical results, Pearson's correlation analysis was conducted to identify possible relationships between variables concerning participants' preferences and beliefs (Cumming & Calin-Jageman, 2017). This analysis was conducted using the Python programming language in the Jupyter Notebook shell. Correlations have been organized into tables displaying r and p-values, which are included in Chapter 4.

Analysis of text responses to open-ended survey questions was completed after analysis of data from the semi-structured interviews. The coding scheme devised for analysis of interview data, described below, was applied to text responses from the open-ended survey questions. Of the 374 participants who submitted complete survey responses, 95 chose to enter comments in response to question 29 (Do you have any additional comments about group assignments that you would like to share?)

3.5.2 Analysis of Interview Data

The content of the semi-structured interviews required qualitative analysis, which was completed through thematic analysis according to the six-phase approach explained by Braun and Clarke (2012) in order "to see and make sense of collective or shared meanings and experiences" (p. 57) as they related to the three research questions that guided this study. The six phases are: 1) familiarizing yourself with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing potential themes, 5) defining and naming themes, and 6) producing the report (Braun & Clarke, 2012).

The first phase of the thematic analysis process, familiarization with the data, was achieved through the transcription process and then by reading and re-reading the final

transcripts in their entirety. Throughout phase one, I took notes regarding data that stood out as relevant to the research questions in order to assist with the next steps of analysis. This is in keeping with recommendations made by Braun and Clarke (2012) and served as "memory aids and triggers for coding and analysis" (p. 60).

To carry out phases two through five, I employed a deductive approach informed by prior research and the four theoretical constructs mentioned above. Initial coding of the transcripts was carried out using Microsoft Word. The primary goal of this study was to understand students' perceptions of their experiences concerning group work and group idea generation as part of their online courses; therefore, the Community of Inquiry coding template first laid out by Garrison et al. in 2000 and modified in 2010, which was designed for qualitative analysis of data concerning students' educational experiences in online courses, provided a partial framework for the development of codes and subsequent themes. Within the three main themes of cognitive presence, social presence, and teaching presence, Garrison et al. have identified categories and sample indicators. The CoI coding template was originally designed for the analysis of written transcripts from online course discussion board postings and replies; however, it has informed numerous studies that have applied other data collection methods (e.g., Stodel et al., 2006). Adjustments and modifications were necessarily made to the template to account for the analysis of interview transcript data, especially regarding the specific indicators of a given theme or sub-theme. In addition to presence, it was also essential to identify themes of power and agency in the data. The application of Bandura's (2000) SCToA allowed for the identification of the sub-themes of direct agency, proxy agency, and collaborative agency. These sub-themes were not only useful in identifying instances of

choice, influence, and efficacy, but also in pinpointing factors identified in prior research as relevant to group creative idea generation, including moderators, such as the negative moderators of idea fixation and free riding, as well as positive moderators, such as a collectivistic mindset and shared leadership. In accordance with the fourth phase of thematic analysis, the potential themes were reviewed to ensure a set of themes had been created that captured "the most important and relevant elements of the data, and the overall tone of the data, in relation to [my] research question(s)" (Braun & Clarke, 2012, p. 65). Two additional themes, "online environment" and "definitions of success," were added to group codes related to specific factors that influenced university students' preferences and beliefs regarding online group work and online group creativity and perceptions of success in group creativity in an online environment. A sixth theme, "demographics," included codes related to characteristics of an individual that form their identity (e.g., age, gender, etc.) as well as characteristics of the assignment they chose to discuss (e.g., number of people in the group, type of assignment, etc.). Categories within this theme align with demographic information collected using the survey instrument for this study in order to assist with comparison of results. Names for themes were carefully selected and defined to ensure each theme had a clear focus, there was no overlap between themes, and they were directly related to answering the three research questions that have guided this study. Themes were defined as follows:

1. **Cognitive presence:** "the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication" (Garrison et al., 2000, p. 89). Garrison et al. identify four sub-themes: triggering event, exploration, integration, and resolution.

2. **Social presence**: "the ability of participants in a community of inquiry to project their personal characteristics into the community, thereby presenting themselves to the other participants as 'real people'" (Garrison et al., 2000, p. 89). Garrison et al. identify three sub-themes: identifying with the group, communicating, and developing interpersonal relationships.
3. **Teaching presence:** the design, facilitation, and direction of learning activities and learning environment of the community of inquiry (Garrison et al., 2010).
4. **Agency:** "the capability for individuals to consciously choose, influence, and structure their actions in order to achieve a desired outcome" (Emirbayer & Mische, 1998; Gecas, 2003, as cited in Code, 2013, p. 39)
5. **Online environment:** tools, perceived barriers, and perceived assistive aspects of conducting group work online (as opposed to face-to-face).
6. **Definitions of success:** ways in which participants measured their and their group's success.
7. **Demographics:** characteristics of an individual that form their identity

Within each of the six themes, sub-themes and sub-sub-themes were identified (Appendix G). Many sub-sub-themes, particularly those related to presence and agency, were further divided to note either presence or absence, or types of presence. For example, the theme of cognitive presence included the sub-theme of integration, which included the sub-sub-theme of connecting ideas. The code "cognitive presence: integration: connecting ideas: presence" was used to identify instances in which ideas *were* connected, while "cognitive presence: integration: connecting ideas: absence" was used to identify instances in which ideas *were not* connected. This method was a

procedure meant to search for disconfirming evidence, in order to evaluate the credibility of the data (Creswell & Miller, 2000). The theme of cognitive presence also included the sub-theme of exploration, which included the sub-sub-theme of idea generation. Idea generation was not only broken down by "presence" and "absence," but also by the methods by which participants reported their groups to have engaged in the idea generation process. This included independent idea generation, nominal group idea generation, and brainstorming group idea generation. Each interview transcript was carefully coded, and then a fresh copy was re-coded by the researcher. The two coded versions of each transcript were compared with each other to ensure codes were applied consistently and reliably.

In order to continue with the sixth phase of thematic analysis, a data table was created using Microsoft Excel for the purpose of organizing coded data by theme. This allowed for data from all 13 participants concerning each theme, sub-theme, and sub-sub-theme, to be viewed and considered in its entirety, inclusively and systematically. Analysis was conducted throughout the process of organizing the data in the data table, as well as after the table was complete, and by drafting a report focused on answering the research questions, which is presented in Chapter 4 of this thesis.

3.6 Validity and Reliability

Several measures were taken to ensure validity and reliability throughout this research study. First, the method of data analysis for this study, triangulation, was chosen as a means of enhancing the credibility of this study and its results (Leedy & Ormrod, 2015). By collecting both quantitative and qualitative data concerning the same research questions, analyzing data separately, and then comparing and contrasting results of

analyses, discrepancies in results can be examined and discussed (Creswell, 2006; Creswell & Miller, 2000). This had led to more reliable results than using either method of data collection in isolation.

As mentioned above, the survey instrument design was based on surveys used in prior research (e.g., Zhou & George, 2001) in order to allow for reliable comparison of results from the current study to findings from previous research. All participants viewed the same recruitment and consent documents, and completed the survey using a standard format in the same survey software interface, which also served to increase reliability (Leedy & Ormrod, 2015). In addition, the survey was limited to less than 30 questions in order to focus on the collection of specific data related to the research questions, especially RQ1 and RQ3 (Leedy & Ormrod, 2015).

The processes of qualitative instrument design, recruitment, data collection and thematic analysis were undertaken with great care. I began by focusing on reflexivity, which included reflecting on my own personal and philosophical assumptions in order to reduce their influences throughout this process (Creswell & Poth, 2018). To avoid bias in recruitment, interviews were scheduled on a first-reply-first-scheduled basis and preference was not given to students from any particular programs, levels of study, or other identifiable group. In addition, all email correspondence with potential participants was uniform, other than differences in the date and time of scheduled interviews, and responses to individual potential participant's specific questions or concerns. All interviews were conducted using the same video conferencing system, Microsoft Teams, to ensure differences in platforms were not a factor, and audio recording equipment was thoroughly tested prior to beginning data collection to ensure technical difficulties did not

interfere with participants' abilities to comfortably respond to questions. I intentionally avoided taking notes during the interviews, instead choosing to only record each participant's own words for transcription in order to focus my attention on the interview and to ensure the facts of each participant's reported experiences were not connected to my initial reactions or interpretations (Leedy & Ormrod, 2015). The process of transcribing, coding and re-coding qualitative data using Microsoft Word, then compiling qualitative data in a data table, was another measure meant to ensure validity and reliability. This systematic, multi-step process helped ensure "generalizations are supported by adequate evidence" in that it allowed for the "consideration of deviant case analysis" as recommended by Seale and Silverman (1997, p. 380). It also allowed for a process of "disconfirming evidence" described in section 3.5.1, another measure intended to ensure validity and reliability (Creswell & Miller, 2000, p. 127).

3.7 Research Ethics

The research design described above was submitted to Dalhousie University's Social Sciences and Humanities Research Ethics Board on July 6, 2020. Approval was received on August 13, 2020. In order to expand the study population and add an incentive to the survey, I submitted two amendment requests to Dalhousie's REB, the first on September 29, 2020, and the second on October 22, 2020. Final approval was received on October 27, 2020 (REB # 2020-5235).

3.8 Participant IDs

Interview participants are identified in the following chapters according to their level of study and a numerical identifier. The IDs used to identify the 13 participants are:

Undergraduate Student 1	Graduate Student 1
Undergraduate Student 2	Graduate Student 2
Undergraduate Student 3	Graduate Student 3
Undergraduate Student 4	Graduate Student 4
Undergraduate Student 5	Graduate Student 5
Undergraduate Student 6	
Undergraduate Student 7	
Undergraduate Student 8	

Any information shared by participants that would allow for their identification or the identification of their group members, instructors, or any other individuals has been removed.

3.9 Summary of Chapter

This chapter has provided a justification for and explanation of the mixed-methods design of the current research study, including an explanation of the data collection and analysis methods used. The four theoretical constructs that informed the design and plan for analysis, social constructivism, Sensemaking, the Community of Inquiry model, and the Social Cognitive Theory of Agency, were also described. The study design approved by Dalhousie's Research Ethics Board included steps taken to protect participants from exposure to any unnecessary or unexpected risks, and to ensure the validity and reliability of results. Findings from this study are reported in the next chapter.

Chapter 4: Findings

In this chapter, findings from the analysis of survey and semi-structured interview data are reported in sections 4.1, 4.2, and 4.3 according to the three research questions that guided this study:

RQ1: What are the preferences and beliefs of university students regarding group work and creative group processes?

RQ2: How do university students engaged in group work participate in creative group processes in an online environment?

RQ3: Are there specific factors that influence university students' perceptions of success in group work and creative group processes in an online environment?

Within each section, findings from the analysis of the survey questionnaire are explained first, followed by findings from the semi-structured interviews.

Findings from the survey questionnaire are first reported using descriptive statistics to provide a simple summary of responses to those survey questions that best connect to each research question. A table displaying total numbers of responses for each numerical point (1-7) for the Likert-scale questions is included in Appendix H. Within the body of this chapter, findings for Likert-scale questions are organized by percent disagree (Likert-scale responses 1-3) and percent agree (Likert-scale responses 5-7). The mean responses are also presented. Relevant findings concerning correlation are also reported for RQ1 and RQ3. Findings for survey question 12, which was a multiple-select question with an open-response "other" option, have been organized into summary categories that align with the coding scheme used for thematic analysis of semi-structured

interview data. Responses to survey question 29, which was an open-response question asking participants if they had any other comments to share regarding group assignments, have been analyzed using the thematic coding scheme as described in the preceding chapter.

To report findings from the semi-structured interviews, each research question has been addressed by explaining aspects of those of the six main themes (cognitive presence, social presence, teaching presence, agency, online environment, and definitions of success) that directly relate to the given question. Section 4.1 explains findings related to the first research question, focusing on providing a general overview of findings concerning students' preferences and beliefs regarding group work and group creativity, especially in an online environment. More detailed findings are included in sections 4.2. and 4.3, which delve into results concerning the second and third research questions, each of which are focused on more specific aspects of group creativity in an online educational environment. Comparison and integration of findings is provided in the chapter that follows (Chapter 5).

The importance of context in shaping students' beliefs, preferences, and perceptions, as well as to the qualitative findings, cannot be underestimated. Participants came from a variety of educational backgrounds, parts of the world, and academic programs, and interview responses indicated a wide range of prior work and life experiences among participants. In addition, assignment types were varied, as were group sizes, course structures, levels of instructor support and engagement, and other factors. Some aspects of the theme "demographics," such as level of study, group size, and assignment type, are considered throughout the analysis in such a way as to identify

commonalities among students with relatively similar experiences. As such, findings are carefully contextualized in such a way as to be able to make accurate generalizations while avoiding assumptions of causation.

4.1. RQ1: What Are the Preferences and Beliefs of University Students Regarding Group Work and Creative Group Processes?

The survey questionnaire and the semi-structured interviews both asked students to respond to questions concerning their preferences and beliefs regarding group work and group creativity, which are reported below.

4.1.1 Findings from Survey Questionnaire

Participants' responses to the survey questionnaire demonstrated several preferences and beliefs regarding group work and group creativity. Summarized findings for questions 13-15 and 17-22 from the descriptive statistical analysis are included in Table 1 below. First, most participants (70%) agreed that they would rather complete an individual assignment than a group assignment (mean = 5.23). Most (67%) also agreed that they would rather work with people they knew than people they had just met (mean = 5.3), and the majority (83%) agreed that some people are simply lazy and will let others in their groups do all the work if possible (mean = 5.8).

Table 1

Participants' Preferences and Beliefs Regarding Group Work (n = 374)

Survey Question	% Disagree (1-3)	% Agree (5-7)
(Q13) I would rather complete an individual assignment than a group assignment.	17	70
(Q14) I would rather work with people I know than people I have just met.	16	67

Survey Question	% Disagree (1-3)	% Agree (5-7)
(Q15) I would rather try to come up with new ideas in collaboration with others than on my own.	31	43
(Q17) Group assignments are more difficult than individual assignments.	20	62
(Q18) Some people are just lazy and will let others do all the work if they can get away with it.	10	83
(Q19) Participating in group assignments can help students develop useful skills for the future.	12	77
(Q21) It is more effective for groups to work together in person than remotely.	15	73
(Q22) Students working together at my level of study are mature enough to complete group assignments without discussing roles and expectations.	43	41

There was no clear agreement or disagreement demonstrated by participants regarding the next statement, "I would rather try to come up with new ideas in collaboration with others than on my own," as 31% of participants disagreed with this statement, and 43% of participants agreed (mean = 4.2). There was also no clear finding concerning participants' agreement or disagreement with the statement, "Students working together at my level of study are mature enough to complete group assignments without discussing roles and expectations," with 43% of students disagreeing and 41% agreeing (mean = 3.9).

Although participants' responses demonstrated the belief that group assignments are more difficult than individual assignments (62% agreed, mean = 5), the majority of participants (77%) agreed that participating in group assignments can help students develop useful skills for the future (mean = 5.5). In addition, most participants (73%)

agreed that it is more effective for groups to work together in person than remotely (mean = 5.4).

To explore these descriptive findings in more detail, Pearson's correlation analysis was conducted. First, in order to better understand what might be correlated with a preference for individual assignments, responses to Q13 were compared to individual questions concerning preferences and beliefs (Q14 through Q22); however, only those results that demonstrated some degree of correlation and had a p value of less than 0.05 are included in Table 2 below. Findings from this analysis indicate there is a fairly strong correlation between a preference for individual assignments and a preference for working with people one already knows ($r = .339$, $p < .001$), and between a preference for individual assignments and the belief that group assignments are more difficult than individual assignments ($r = .499$, $p < .001$). These findings indicate that students who would rather complete an individual assignment than a group assignment would also rather work with people they know, and that students who prefer individual assignments also believe group assignments are more difficult. There is also a weak correlation between a preference for individual assignments and the belief that some people are lazy and will let others do all the work if they can get away with is ($r = .167$, $p < .01$).

Table 2

Correlations to a Preference for Individual Assignments (n = 374)

Variables	**(1)**
(Q13) Prefer individual assignments (1)	1
(Q14) Prefer working with known group members	.339***
(Q15) Prefer generating ideas with others	–.226***
(Q17) Believe group assignments are more difficult	.499***

Variables	(1)
(Q18) Believe some people are just lazy	.167**
(Q19) Believe group assignments help develop useful skills	–.228***
(Q22) Believe students are mature enough to complete group assignments without discussing roles and expectations	–.156**

Note. *p < .05, **p < .01, ***p < 0.001

There is a moderate negative correlation between a preference for individual assignments and a preference for generating ideas with others (r = – .226, p < .001), which indicates that students who would rather complete an individual assignment than a group assignment tend not to prefer generating ideas in collaboration with others. Notably, although 77% of participants agreed that participating in group assignments can help students develop useful skills for the future, there is also a negative correlation between a preference for individual assignments and this belief in the value of group assignments for skill development (r = – .228, p < .001). This indicates that students who prefer individual assignments tend not to believe group assignments help them with skill-building. Finally, there is a weak negative correlation between a preference for individual assignments and the belief that students are mature enough to complete group assignments without discussing roles and expectations (r = – .156, p < .01), which indicates students who would rather work alone than in a group tend not to have faith that they and their peers possess the maturity to complete group assignments without discussing roles and expectations.

Correlation analysis was also conducted to gain a better understanding of potential relationships between students' preference for working with others they already know and their beliefs about group assignments. To conduct this analysis, responses to

Q14 were compared to questions 16 through 22. Results that demonstrated some degree of correlation and had a p value of less than 0.05 are included in Table 3 below. Findings from this analysis indicate a preference for working with known group members is somewhat correlated with the belief that group assignments are more difficult than individual assignments ($r = .254$, $p < .001$), the belief that some people are lazy and will let others do all the work if possible ($r = .209$, $p < .001$), and the belief that group work is better in person than remotely ($r = .193$, $p < .001$).

Table 3

Correlations to a Preference for Working with Known Group Members (n = 374)

Variables	**(1)**
(Q14) Prefer working with known group members (1)	1
(Q17) Believe group assignments are more difficult than individual assignments	.254***
(Q18) Believe some people are just lazy	.209***
(Q21) Believe group work is better in person than remotely	.193***

Note. *p < .05, **p < .01, ***p < 0.001

Finally, correlation analysis comparing a preference for generating new ideas in collaboration with others (Q15) was compared to students' beliefs about group assignments (Q16 – Q22). As above, results that demonstrated some degree of correlation and had a p value of less than 0.05 have been included (Table 4). Findings from this analysis indicate that there is a fairly strong correlation between a preference for generating new ideas in collaboration with others and the belief that group assignments assist in the development of useful skills for the future ($r = .304$, $p < .001$). There is a weaker correlation between a preference for generating new ideas in collaboration with others and the belief that students are mature enough to complete group assignments

without discussing roles and expectations ($r = .163$, $p < .01$). Additionally, there is a somewhat weak negative correlation between a preference for generating ideas in collaboration with others and the belief that group assignments are more difficult than individual assignments ($r = – .133$, $p < .01$), which indicates that students who prefer coming up with new ideas with others may also tend to believe group assignments are easier than individual assignments.

Table 4

Correlations to a Preference for Generating New Ideas in Collaboration (n = 374)

Variables	**(1)**
(Q15) Prefer generating new ideas in collaboration with others (1)	1
(Q17) Believe group assignments are more difficult than individual assignments	–.133*
(Q19) Believe group assignments help develop useful skills	.304***
(Q22) Believe students are mature enough to complete group assignments without discussing roles and expectations	.163**

Note. *p < .05, **p < .01, ***p < 0.001

In addition to the statistical analysis of Likert-scale questions described above, thematic analysis was conducted on responses to the optional final question of the survey. Of the 95 participants who responded to this question (Q29. Do you have any additional comments about group assignments that you would like to share?), 24 shared their feelings about group work in general. Eight participants explained that they liked group work, 11 expressed a dislike for group work, and five described having mixed feelings. The eight participants who expressed a liking for group work felt that group assignments helped them keep an open mind, learn from others, and/or sustain their motivation for learning due to feelings of accountability to others in the group. The 11 participants who stated their dislike for group work either stated simply that they did not like group work,

or that they found group assignments to be frustrating and stressful due to unequal distribution of work, dealing with ineffective group members, and/or managing logistical difficulties. The five participants who described having mixed feelings about group work believed their experiences were entirely dependent upon the personalities, abilities, and dedication of their group members.

Fifty-three of the 95 participants who responded to question 29 shared their beliefs regarding online group work in particular. Fifty participants stated that they believed online group work was significantly more difficult than face-to-face group work due to difficulties with online communication, problems developing working relationships using only online tools, the tendency of some group members to completely disappear from any shared virtual spaces without explanation, and/or issues connected to temporal distance (e.g., finding meetings times that work for group members located in different time zones). Two participants felt that working in groups online was better than working face-to-face because it was more efficient, and one participant described positive and negative aspects of online group work.

Eleven of the participants who responded to question 29 expressed several specific preferences concerning online group work in their responses. First, four participants stated that they preferred to be able to choose their own group members for online assignments because having previous relationships made online communication much easier. Four other participants stated a different preference, explaining that they found it stressful when instructors required them to choose their own group members because they had no way of getting to know the other students in online classes. Three

participants noted a preference for establishing ground rules with their group members and believed that this step was necessary to ensure a successful group experience.

In addition, seven participants entered comments that were off-topic, such as describing their feelings about the survey questionnaire. Though I have taken these comments under advisement for future research, these responses have not been included in the findings of this study because they were not relevant to the research questions or to the current study in any way.

4.1.2 Findings from Semi-Structured Interviews

Participants' responses throughout the semi-structured interviews indicated a consistent set of preferences and beliefs regarding group work and group creativity, which are explained in the sections below. Though the semi-structured interviews focused on participants' experiences with a particular online group assignment, most participants expressed a general aversion to group assignments at some point during their interviews. As Graduate Student 5 succinctly put it, "I really do not like group projects." This sentiment was echoed throughout the interviews, either explicitly through similarly direct statements, or implicitly, through the ways in which participants described their past and ongoing group experiences. Although the majority of participants demonstrated a general dislike of group work, three participants described an appreciation for group work under the right conditions. As Undergraduate Student 4 put it, "Personally, I don't mind meaningful group work because I think that's a better way to do it than every man for himself until the last minute and then combine everything together." Participants described several key components of group work in general, and online group work in particular, that have shaped their beliefs and perceptions, which are explained below

through explorations of aspects of the following themes: online environment, cognitive presence, social presence, teaching presence, and agency.

Online environment. In addition to a general antipathy to group assignments, all 13 participants attributed an increased level of frustration and difficulty to group assignments carried out in an online environment. Participants indicated that online communication was a barrier throughout their group work experiences regardless of the technologies their group used, the particular assignment structure, and the procedures the group implemented to carry out their work. As Graduate Student 2 said of online group work,

> I don't find the ideas move through this medium very well. That creativity really gets lost when you're trying to talk to somebody, and you can't necessarily have the same type of conversation because you're just trying to manage basic communication of information and ideas without talking over each other or dealing with technical issues….Where, if you're in person, you can say "Oh, this is what I found," and if they just say, "OK, cool," you know it's time to stop or whatever, right? Because they're not interested. Or, in person, you can be more creative together because you can kind of start adding to an idea sooner, so if the person says something, you can jump in more naturally.

Overall, participants believed that the online environment was detrimental to their groups' creative output.

While participants expressed degrees of frustration with online learning and online group work, they also understood that the circumstances that led to the need for online learning in the Fall 2020 semester were outside of the control of anyone involved

and were likely not anyone's preference. As Undergraduate Student 7 said, "I know that students are having a hard time and I also know that the professors are having a hard time because we're all trying to adapt. So, I think that it might all be just a bit easier if it wasn't online."

Cognitive presence. Participants' responses indicated that they believed one of the potential benefits of working in a group, the ability to generate ideas and work with others to construct meaning, was strongly negated by the online learning environment. The majority of participants stated that they would have collaborated more with group members throughout the idea generation and decision-making processes if they had been able to meet in person. When asked to compare their experiences with their online group assignment to past face-to-face group assignments, Undergraduate Student 1 said,

> For the written thing it was a little bit different because we, kind of, just divided up the work and then did it individually, whereas in the past I think it would be more…we'd still divide up the work and do it individually, but, say, I'd ask for someone's opinion on my part, and there'd be a little bit more collaboration.

Participants also did not typically discuss ambiguities in their understandings, instead making sense of information on their own. As Undergraduate Student 6 noted, "it was a lot of everyone just kind of collaborating on their own, and then that one person who summarized was trying to piece together everyone's mess." The use of the phrase "collaborating on their own," is quite interesting, and encapsulates participants' beliefs that working in relative isolation and performing cognitive processes independently are inherent in online group work, and that collaboration comes from submitting finished work to other group members for compilation. Also noteworthy is the participants'

description of the work performed in isolation by their group members as a "mess." While the five graduate student participants did not share the following view, the eight undergraduate student participants believed that the work of group members was often inferior to their own, requiring them to make significant adjustments or additions in order to submit work that was up to their personal standard.

Social presence. All participants believed that the online environment inhibited their abilities to get to know their group members. As Graduate Student 4 stated, "I feel that while I am friendly with these people, because we've never met face-to-face, I certainly don't feel like we're besties." Undergraduate Student 2 shared, "I know less about them than any other group that I've ever worked with before because of the online." Notably, 10 participants felt that one of the most significant effects of the general lack of interpersonal relationships with their online group members was an absence of enjoyment. Rather than appreciating moments of levity, the primary focus for participants was getting through the experience as quickly and easily as possible. As Undergraduate Student 4 concisely explained, "it's a strictly business acquaintance." Graduate Student 5 described a similarly business-oriented approach, stating "I don't know if it might be because we're in an online course, where everyone's just kind of stuck in the same boat, but we were all like, 'I want to get this done. I want to get this, like, completed.'"

Teaching presence. The majority of participants believed the role of the course instructor to be a crucial component in shaping their experiences with online group assignments and group creativity. Overall, participants believed a "Goldilocks" (Larson et al., 2019) level of teaching presence was the most effective method of supporting their groups' work: one that provided enough structure, feedback, and communication so that

they knew what was expected of them, but not so much that they felt stifled and micromanaged. Of the four participants who believed they had not received enough support, all would have liked their instructors to have provided more concrete requirements for carrying out group work in an online setting. As Undergraduate Student 4 explained, "I would actually like the professors to say, 'the group (is) having a fixed Zoom call or fixed video call in any platform.' Some students need the professor to say that because they don't want to do it." Several participants also described their frustration with instructors who had not yet provided any grades despite the semester being more than half over at the time of the interviews, and with instructors who did not respond to students' requests for clarification on assignment guidelines. For example, when asked if they felt their group was successful, Undergraduate Student 6 said that they thought so, but was not certain because, "we have not gotten any marks back yet… I think there's like 7 or 8 assignments that are unmarked at this point." On the other hand, participants who believed they were being micromanaged by their instructors would have preferred less teaching presence. Graduate Student 4, who recounted their experiences completing an experiential group assignment, clearly explained their perception of an overbearing teaching presence. When asked how their group came up with ideas for their project, they explained,

> I wish I had something better to say because we don't come up with ideas. Yeah, like, everything has been dictated for us in this particular assignment. We don't have a chance to actually think. We just do the work... I don't feel that we were really given any creative ownership over this particular project.

The four participants who reported experiences with instructors who provided moderate, flexible support believed this level of teaching presence was beneficial to their group's creative output. When asked if they felt their group was successful in coming up with good ideas, Undergraduate Student 7 shared that their instructor's directions for groups to choose the assignment deliverable they thought would best convey their ideas allowed their group to create a surprisingly engaging end product, stating,

> I mean, like, actually making a podcast was a great idea because when you read it you kind of get bored, but when you actually hear it, like, when I actually heard it, I'm like, 'Oh, that's actually even more interesting.'

While participants' beliefs related to teaching presence varied depending on the context of the group assignment in question, all participants expressed clear preference for a teaching presence that was supportive yet allowed for some level of individual and/or group freedom or choice.

Agency. Participants demonstrated their beliefs and preferences regarding direct personal agency, proxy agency, and collective agency through the ways in which they described their individual and group choices, their interactions with group members, and their feelings about their instructors' actions. The majority of participants expressed an overall preference for choosing group members. As Undergraduate Student 6 said of their experiences with group work over the last few years, "when all your groups are assigned, I feel there's a large sense of, kind of, of the assignments that are out of my control and I don't like that, clearly." However, when discussing the particular online group experience in question, participants who knew others in their class preferred to be able to choose their group members, while those who did not know any or most of their classmates were

grateful for instructor support in organizing groupings. For example, Undergraduate Student 4, who described their experience in a political science course outside of their program faculty, said, “I like that the professor assigned (groups) for us because honestly we don’t know anyone with all online classes right now.” Notably, among the three participants who were permitted to choose their group members, the preference for choice persisted even if their chosen group was not working well together. For example, Undergraduate Student 5, who repeatedly described their group member as lazy and not interested in the assignment, said,

> I was really lucky with finding a partner that I knew and, like, we were both in Halifax. So, like, my partner and I aren't that… like, we don't, he doesn't put in as much effort, but I think being on, like… Microsoft Teams and being together on that would be a lot less efficient, and we just wouldn’t know… I don't feel like if we didn’t know each other anyone would talk.

Participants also believed it was important to trust their group members to assist in meeting assignment objectives regardless of the strength of their sense of social presence within the group. When asked if they felt their group members valued their contributions, Undergraduate Student 2 said,

> No. But I’m just going with it… I normally would call them out if they were underperforming, or if they were slacking or that kind of stuff, but I know the work is going to get done and it's not going to be C-quality work.

Even participants who expressed disappointment with the quality of their group members’ work preferred to trust their group members to complete parts of the assignment, if only to ease their own workload. For example, Undergraduate Student 6,

who lamented about their group's lack of work output and engagement throughout the interview, said, "If sometimes the assignments don't require a face-to-face (video call), we'll just split up the parts, which I honestly like a lot better because then everyone's held accountable to actually do their part."

The four participants who were part of groups that chose to divide work based on individual strengths, which is an expression of collective agency, believed this strategy was an effective method of managing online group work. As Graduate Student 3 stated, "My understanding is such that everyone is competent in their own domain, so it's not like it's such a burden for one person or only two people." Participants who were part of groups that took this approach reported a general satisfaction with their group's ability to generate good ideas, effectively distribute work, make decisions collaboratively, and produce quality deliverables.

4.1.3 Summary of RQ1 Findings.

Overall, participants in both the survey and interviews expressed a dissatisfaction with group work regardless of setting and a preference for working alone, though they did believe that meaningful group assignments could help them develop skills for the future. Participants' responses indicated that they preferred to be able to have some degree of choice when completing group work as this allowed them to feel some sense of control over the experience. Participants' responses also indicated they believed online group work and online creative group processes were significantly more difficult to manage than they would be if carried out in a face-to-face setting due to the difficulties they associated with online communication and collaboration, barriers to getting to know

their group members, and the increased significance of and variations in teaching presence in an online environment.

4.2 RQ2: How Do University Students Engaged in Group Work Participate in Creative Group Processes in an Online Environment?

As mentioned in Chapter 1, creative group processes are defined in this study as the communicative and collaborative processes groups undertake for the purpose of arriving at novel and useful solutions to assignment tasks. The study of how students engaged in online group work participate in these complex processes was primarily undertaken through the collection and analysis of semi-structured interview data, as explained in Chapter 3. One question from the survey questionnaire, however, asked students to identify tools they used as part of online group work. Findings from this question are connected to RQ2 and are reported below.

4.2.1 Findings from Survey Questionnaire

Participants' responses to question 12 (If you have participated in a group assignment for an online class, which tools have you used to conduct group work? Check all that apply.) indicate a variety of tools used to participate in online group work. Of the 374 participants, 146 indicated using University-proved technology (e.g., Microsoft OneDrive) to conduct group work, and 154 indicated using other professional technology (e.g., Google Drive). The communications technologies used also varied, with 282 participants responding that they had used video conferencing tools, 142 responding that they had used text messages, 120 indicating they had used at least one social media application (e.g., Facebook) to conduct their online group work, and 62 participants responding that they had used phone calls.

4.2.2 Findings from Semi-Structured Interviews

Participants' responses to the semi-structured interviews indicated that while the primary creative group process for university students is often idea generation, this process is closely connected to and supported by other task-related processes, including information seeking, information sharing, and decision making. Although formal structures for idea generation, such as brainstorming, were discussed, participants often focused more on their groups' decision making, information seeking, and information sharing processes, in that these were seen as crucial to their ability to create assignment deliverables. As the groups under consideration had to carry out these tasks in an online environment, procedural processes, such as choosing technology to manage information sharing, as well as interpersonal processes, such as responding appropriately to text-based communication, were often intertwined with task-related processes. In addition, participants' responses indicated that the types of technology used shaped the ways in which groups generated and shared ideas and information. As such, findings related to RQ2 centre on two key themes: online environment and cognitive presence.

Online environment. Participants used a variety of tools to take part in online group work, including university-provided technology, such as Microsoft Teams and the software applications included in Dalhousie's Microsoft 365 platform, other professional technology, such as Zoom and Google Docs, and social media and mobile phone technology, such as Facebook Messenger, Instagram direct messages, and iMessage group chats. All participants used university-provided or other professional technology, primarily through the Microsoft Teams platform, for several purposes. First, participants used professional word processing software, such as Microsoft Word, to collaborate in

the creation of assignment deliverables when written deliverables were required. Participants who were required to create presentations used shared Microsoft PowerPoint files to do so. Most participants used the Microsoft Teams platform to organize their shared files, and to communicate and collaborate using text-based chat messages and video meetings. Eight participants also reported using social media or mobile phone technology to share ideas and information when they perceived there to be shortcomings associated with using professional technology for these purposes, such as a desire for group members to respond more quickly to group communication. Notably, all of these reported perceptions reflect participants' and their group members' comfort levels rather than actual deficiencies in the professional tools themselves. For example, Graduate Student 3 explained, "I felt quite ignored when I was communicating with the team using Teams, so I proposed that we should switch to the (Facebook) Messenger platform because I felt that most of us were quite active on Messenger."

The majority of participants indicated that the technology their group used affected the ways in which they communicated and collaborated for the purpose of arriving at novel and useful solutions to assignment tasks. Although, as explained above, none of the participants felt their groups communicated or collaborated as well online as they could have face-to-face, the eight participants who were part of groups that frequently held meetings using video conferencing tools reported that their groups did the majority of their idea generation and decision making, and a significant portion of their information sharing, during these meetings, and that efforts were made to ensure all group members present shared their ideas. All participants also described sharing ideas and information in text form through chat messages and shared files. The two participants

who reported engaging in collaborative information seeking also did so while in video meetings.

Cognitive Presence. To explore the theme of cognitive presence as it relates to RQ2, the sub-themes of exploration and integration will be examined in detail. As detailed in the thematic analysis coding scheme (Appendix G), the section concerning exploration includes findings related to triggering events, generating ideas, seeking information, sharing information, and discussing ambiguities. The "integration" section includes findings related to connecting ideas and making decisions. Instances related to the other aspects of integration identified during the thematic analysis process, resolving conflicting understandings and creating solutions, did not occur often enough among the participants to lead to the identification of findings in these areas.

Exploration. All participants indicated that their groups began their work by attempting to identify assignment requirements and determining procedures for how to approach their work. The majority of participants (10) reported that the assignment guidelines provided by the instructor informed them of exactly what they had to produce. Plans for how to approach assignment tasks, however, were mostly left up to participants and their group members. Eight participants were part of groups that were provided minimal or no guidance regarding planning their approach to the procedural, interpersonal, and task-related processes of their work. Responses from these eight participants indicated a minimal level of group discussion regarding these topics. Five participants were required to complete and submit team charters, which forced them into discussions related to some of the processes they would need to undertake. Responses from these five participants indicated that the team charter assignment required them to

discuss interpersonal and procedural processes, such as strengths and weaknesses, goals for the project, preferred means of communication, and expectations for each other, and to determine which group member would be responsible for managing each aspect of the group's work.

Although 10 participants' responses indicated that their groups used somewhat structured approaches to the task-related processes of idea generation, information seeking and sharing, connecting ideas, and making decisions, none of the 13 participants reported that their groups had explicitly discussed how they would carry out these specific processes. Furthermore, most participants had difficulty articulating their groups' approach to some of these processes. When asked how their group came up with ideas, Graduate Student 4, said, "It's so difficult when everything's online to think about what our process even is, you know what I mean? Like, do we even have a process? Honestly, at this point it feels like it's just notifications on Microsoft Teams." In their response to the same question, Graduate Student 2 echoed this sentiment, stating, "It's funny because it never really occurred to me to consider, like, the 'how.'"

Participants' responses to questions about their groups' idea generation processes were varied. In response to questions nine (Can you tell me about how your group came up with ideas in the beginning stages of this assignment? Did you each spend time on your own thinking of ideas, did you brainstorm together, or something else?) and ten (What about later as you worked on the assignment?), five participants said they and their group members only generated ideas independently and added them to shared files, four participants indicated that their groups only used a brainstorming process to generate ideas, two participants described using both brainstorming and independent idea

generation to come up with ideas, and the responses of two participants indicated that they felt their groups did not generate any ideas as part of the assignment in question. None of the participants described using a nominal group technique to generate ideas.

Of the 13 participants, 11 indicated that their groups sought information independently, sharing information at a later stage in the process. Undergraduate Student 5, one of the two participants who described seeking information in collaboration with their group member, quickly abandoned the practice as they felt they would be more productive seeking information on their own, as they believed their group member was "just really lazy." All participants reported sharing task-related information with their groups, and responses indicated that effective information sharing was connected to a group's ability to create assignment deliverables.

Of the five participants who described any discussion of ambiguities with their group members, two mentioned minimally discussing interpretations of content-related information, while three explained that the few discussions of ambiguities their groups had had were focused on deciphering assignment requirements. For example, when asked how their group decided which ideas to use, Undergraduate Student 8 replied,

> It was not really difficult to decide which ideas to use. To be honest I think the debate that would happen would be someone asking, like, 'Is this what we need to do? Are we on the right track?' Just because they didn't do their research, they don't understand the assignment. But nothing that would actually contribute, like, to the final idea.

Overall, participants' responses indicated that although groups did not often discuss ambiguities in their ideas, they often engaged in conversations related to connecting ideas

and making decisions about which ideas to use. Findings concerning these processes are reported below.

Integration. Of the 13 participants, all but one reported that none of their ideas had been rejected outright by their group. Rather, their ideas had been adapted or rephrased in such a way as to preserve the original spirit of the ideas while weaving them into the larger fabric of the group's work. In describing the process by which their group connected ideas, Graduate Student 3 explained,

> They would include those one or two main components of my idea in the main file, or they would go a step further and they would add something, and say, "Oh, because of that component, this is something that we can do more." And then I am glad that I brought up the idea, because the idea… people built on that idea to probably have a better idea.

Notably, seven participants, all undergraduate students, described instances in which ideas of others in their group were completely rejected, sometimes by the participant themself. Participants described decisions to reject the ideas of others as based on beliefs that the ideas were incorrect or inferior. For example, Undergraduate Student 6 said of their group member's ideas, "One of her answers to a question, it just did not … it's almost like she didn't understand the question, which can happen. So, I think I ended up just not including her ideas in that response for that question." When asked if they had informed their group member that her idea would not be included, Undergraduate Student 6 said,

> I didn't tell her that I didn’t use hers, no. I felt bad, but I just kind of, like, I felt there was no need to message her and say, like, ‘By the way, your answer was not good, but I had enough content from the other two.’

It is worth mentioning that Undergraduate Student 6 was one of the four participants who used text-based social media applications or mobile phone text messages as the primary means of group communication. In fact, all four of the participants who relied on text-based communication were among the seven participants who described instances of group members’ ideas being rejected rather than adapted or accepted.

Participants’ responses indicate that decision making occurred unilaterally, collaboratively, or by majority vote. Among the eight undergraduate students, three reported that all decisions were made unilaterally by the person who had taken a leadership role in the group, three described collaborative decision-making processes by which the group came to a consensus before making final decisions, one described decisions made by a majority vote, and one reported that their group had made decisions collaboratively at the start of their time working together but had shifted to majority vote soon after, as one group member, according to the participant, stubbornly took the opposing stance on every decision and refused to compromise. All five graduate students reported that their groups’ decisions were made collaboratively.

4.2.3 Summary of RQ2 Findings.

Participants’ responses demonstrated a fairly wide variety in methods used to participate in creative group processes in an online environment, and that these processes were complex and intertwined. Participants used a variety of professional technologies to carry out their work, along with social media and mobile phone technology, and specific

technological tools used for communication and collaboration shaped the ways in which participants' groups generated and shared ideas and information. Participants' responses indicate a lack of purposefully determined processes related to idea generation, information seeking and sharing, idea connection, and decision making, and participants often had difficulty reflecting on some of these processes.

4.3 RQ3: Are There Specific Factors That Influence University Students' Perceptions of Success in Group Work and Creative Group Processes in an Online Environment?

Descriptive findings concerning survey questions 16, 20, and 23-28 help to develop an overall understanding of participants' perceptions of their own skills, creative abilities, and contributions to their groups' creative success. To further understand how these perceptions might be connected to the online environment, Pearson's correlation analysis was conducted to compare each of the creativity questions (23-28) to Q21 (It is more effective for groups to work together in person than remotely). These findings are described in section 4.3.1. Detailed, nuanced findings from the analysis of semi-structured interview data related to RQ3 are described in section 4.3.2.

4.3.1 Findings from Survey Questionnaire

Overall, participants agreed with positive statements concerning their own group-work-related and creativity-related skills and abilities. The large majority of survey participants (89%) agreed that they had the necessary skills to work well as part of a group (mean = 5.9), and that it is important to do everything you can to avoid conflict when working with others (66%, mean = 5.1). Most participants also agreed that they often suggest new ways to achieve goals or objectives (76%, mean = 5.27), often come

up with new and practical ideas to improve performance (77%, mean = 5.27), exhibit creativity in their work when given the chance (81%, mean = 5.44), and come up with creative solutions to problems (79%, mean = 5.31). Furthermore, most participants agreed that their contributions to group work were creative (76%, mean = 5.29) and original (80%, mean = 5.5). A summary of responses to survey questions related to these points is provided below.

Table 5

Participants' Beliefs Concerning Their Group Work Skills and Abilities (n = 374)

Survey Question	% Disagree (1-3)	% Agree (5-7)
(Q16) I have the necessary skills to work well as part of a group.	4	89
(Q20) It is important to do everything you can to avoid conflict when working with others.	17	66
(Q23) I often suggest new ways to achieve goals or objectives.	7	76
(Q24) I often come up with new and practical ideas to improve performance.	7	77
(Q25) I exhibit creativity in my work when given the opportunity to.	7	81
(Q26) I come up with creative solutions to problems.	8	79
(Q27) My contributions to group work are creative.	7	76
(Q28) My contributions to group work are original.	5	80

As mentioned above, Pearson's correlation analysis was conducted to develop a fuller understanding of possible connections between students' beliefs about their own creativity and creative contributions to group work and their beliefs concerning the efficacy of participating in group work in an online environment. To accomplish this,

responses to Q21 (It is more effective for groups to work together in person than remotely) were compared to each of the creativity questions displayed above in Table 5 (Q23 – Q28). As shown in Table 6 below, there is a weak positive correlation between each of the creativity measures and the belief that it is more effective for groups to work together in person than remotely. This suggests that university students who believe online group work is not as effective as face-to-face group work are more likely to believe they are more creative in general and to believe they make more creative contributions to group assignments. Although the correlations reported here are rather weak, these findings indicate students' feelings about online group work could possibly influence their perceptions of success in creative group processes.

Table 6

Correlations to Belief in Efficacy of In-Person Group Work (n = 374)

Variables	**(1)**
(Q21) Believe group work is better in person than remotely (1)	1
(Q23) Believe they often suggest new ways to achieve goals or objective	.141**
(Q24) Believe they often come up with new and practical ideas to improve performance	.122*
(Q25) Believe they exhibit creativity when given the opportunity	.199***
(Q26) Believe they come up with creative solutions to problems	.135**
(Q27) Believe their contributions to group work are creative	.189***
(Q28) Believe their contributions to group work are original	.193***

Note. *p < .05, **p < .01, ***p < .001

4.3.2 Findings from Semi-Structured Interviews

To discuss findings from the semi-structured interviews related to specific factors that influence university students' perceptions of success in group work and group

creativity in an online environment, it is necessary to understand the ways in which university students define success. Participants' responses indicated that they construct definitions of success based on internal values as well as external measures, such as grades. Findings in this section are organized based on participants' definitions of success and the factors they perceived to have influenced their groups' abilities to successfully engage in online group work and online creative group processes. Central to this explanation is the influence of the online environment on students' perceptions. Throughout their interviews, participants demonstrated their beliefs that the online environment was a significant factor in shaping the particular group experiences in question, and that their ability to realize success in online group work and online group creativity was connected to their ability to navigate the virtual world.

Definitions of Success. Although participants were not directly asked to define success, they were asked if they felt their groups were successful in coming up with good ideas (Q11) and if they felt their groups were successful overall (Q18). In responding to these questions, participants explained their rationales for their specific answers. Participants also demonstrated their personal definitions of success throughout their interviews in the ways in which they described their feelings about their groups' processes, relationships, and end products.

Effective Communication and Collaboration. All 13 participants shared responses that showed their definitions of success were related to their groups' abilities to communicate and collaborate effectively. Six participants specifically mentioned open-minded communication as a key component of their groups' success in this area. Three of these six participants mentioned a lack of open-minded communication as a barrier to

their group's success, and three noted how open-minded communication helped their groups generate ideas and share information, which led to overall successful group experiences. As Graduate Student 5 shared, "I think what also helped is that we didn't come into the group like, 'This is what I'm going to do, and this is what I know, and this is how it's going to look.' It was always a conversation."

Participants believed effective communication and collaboration could foster healthy debate among group members and lead to the selection of good ideas, but that avoiding uncomfortable communication could also be deemed "effective," and could contribute to a group's overall success. Of the six participants who described any social conflict or potential social conflict among their group members, five described taking steps to avoid dealing with the conflict directly rather than communicating with their group to attempt to resolve it. For example, Graduate Student 3 described using an online tool called Planner, which is part of the Microsoft Teams platform, in order to avoid conflict before it began. As they explained,

> Planner works in such a way that it would send a reminder to that person on a regular basis, so that is useful. Rather than a human reminding you or a teammate reminding you, a robot does it. So, that's fine and it avoids a lot of conflict.

When asked if their group had had any conflicts or disagreements, Undergraduate Student 8 responded, "Disagreements? Not really. I mean, I just do the work myself if they don't do it," explaining that doing the work themself often led to a better product than when the whole group participated.

Participants' responses indicated that they perceived the online environment to be a significant factor that affected their group's ability to communicate and collaborate

successfully. Perceived barriers to online group work and group creativity were the awkward and unnatural communication of video meetings, frustrations with delays in group members' response times when using written online communications, such as chat messages, and a general lack of depth to online conversations as compared to face-to-face conversations. As Undergraduate Student 4 said,

> I definitely prefer working in person…because it's easier to talk, to debate the ideas… if you talk through the screen… you just lose that, and sometimes people are just going to agree with whatever is there on the screen because it's too hard to talk it out that way.

These perceptions persisted regardless of participants' overall feelings and experiences with the particular group assignment in question. For example, Graduate Student 1, who effused throughout their interview that their "group is amazing," also described having significant difficulties communicating with group members due to issues with message notifications, miscommunication caused by the group's use of multiple online platforms for different tasks, and inefficiencies the participant ascribed to using video calls to communicate. Eight participants felt that effective communication and collaboration was important to their group's success, but that they did not know how to navigate social conflict in an online environment, and thus had no choice but to avoid dealing with it. As Graduate Student 4 explained,

> I don't see our conflicts being resolved in the current online environment as it stands because there's no consequence. There's no way to mediate that properly. I think if we were doing this face-to-face, it would be much easier to speak to someone, like a project coach or other group members, on the side without a

> formal email interaction to bring up concerns. It would be easier to pull someone aside and say 'Hey, I really didn't like how that meeting went. I'd prefer if you could not, you know, throw my name under the bus whenever you feel threatened.' That sort of side conversation or informal meeting isn't really possible in the current online environment.

Notably, the four participants who used text-based social media applications or mobile phone text messages as their primary means of communication with their group members reported difficulty with collaborative idea generation, information sharing, and decision making caused by their chosen means of communication. The most salient example of this phenomenon is described by Undergraduate Student 3, whose group only communicated in weekly "meetings" using Instagram direct messages (DMs). At a designated time on a certain day of the week, Undergraduate Student 3 and their four other group members agreed to open the Instagram applications on their phones and communicate with each other using text-based messages to plan their group's marketing strategy and make decisions for a simulation-based assignment. "We chose to meet up just in Instagram DMs because that's what made it easiest for all of us to communicate," they shared, followed by an explanation that several of their group members had stopped logging in, and that the content and quality of their messages had decreased over time, stating, "Every week people, sort of, care a little bit less." Reflecting on their experiences, Undergraduate Student 3 said, "I do think speaking on video, we would put more thought into what we're saying, just instead of typing 'yes' and moving on with their lives."

While less of a problem for graduate students, six of the eight undergraduate student participants reported that some of their group members mostly ignored the group throughout the process of completing the assignment, some completely withdrawing from all communication, a practice often referred to as ghosting. For example, Undergraduate Student 1 shared that while they felt their group was successful overall, two of the six members had disappeared from their shared virtual spaces. As they explained,

> We did reach out to them, and we were like, 'Okay, you at least need to give us your Banner numbers so we can, like, put your names on the project,' but then I don't even think they responded to that.

Undergraduate Student 8 also noted that ghosting was recognized by their instructor as a wide-spread problem in the class, explaining,

> So, we had, like, a Zoom meeting with the whole class, like, midway through, and he was saying, 'We notice a lot of difficulty with groups, people ghosting, not responding, not showing up. So, if that happens, you can just do a chunk. Do your part and submit that.'

Participants who experienced ghosting among their group members believed that this phenomenon would not have occurred in a face-to-face setting. Undergraduate Student 3 shared that they found past face-to-face group experiences more successful because it was "a lot easier than, sort of, trying to chase people down who are in different time zones." Only one of the five graduate student participants described feeling ignored, and only briefly, which they attributed to difficulties with their group members receiving Microsoft Teams notifications. As mentioned above, their group soon switched to Facebook Messenger for communication, which alleviated the problem.

Group Cohesion. Participants' responses indicated that group cohesion, defined here as a group's sense of unity or togetherness, was another common definition of success. Nine participants mentioned group cohesion as important to their feelings of success, though this definition was more common among graduate student participants than undergraduate student participants. In fact, all five graduate student participants felt that fostering group cohesion was more important to their groups' abilities to produce creative, high quality end products than focusing on external factors. As Graduate Student 1 explained, "It doesn't matter how (good) the work deliverable would be. It matters from the marks perspective and everything, but I believe what matters most is the respect for each other and the bond that you form." Three of the four undergraduate students who included group cohesion in their definitions of success mentioned that they felt the lack of cohesion had likely affected their groups' work, and that they could have generated better ideas and done better work overall if their groups had been more unified. These three students also attributed their groups' lack of cohesion to working in an online environment. As Undergraduate Student 3 explained,

> I do believe if we were all together sort of living in the same place with the same time zone, we could talk more about other things and sort of relate to each other. When we're all living in different places with completely different lives it's hard to really connect and share the same lives and experiences as them. So, I do think we would end up working better and getting things done more on time if we were in person.

Notably, all graduate student participants felt that group cohesion could be achieved without strong interpersonal relationships, perceiving the former to be connected to

shared work goals and the latter to shared social experiences. For example, Graduate Student 2 explained, “this is a good group in that it’s sufficient in spite of not knowing each other, not being able to do everything we could in person.” None of the undergraduate student participants indicated or articulated this distinction. All participants, however, generally believed that stronger interpersonal relationships would have benefitted their groups’ overall success.

The five participants who made statements indicating that they and their group members had a collectivistic mindset also described a greater degree of group cohesion and creative success than other participants. Some participants explicitly recognized the benefit of a collectivistic mindset to their groups’ success. As Graduate Student 3 explained when asked if they thought their group had been successful, “I would say so, because, I mean, all group members are taking the ownership to complete the project.”

Participants’ responses indicated that the two most significant perceived barriers to group cohesion included a lack of shared leadership, and free riding, which occurs when one or some members of a group rely on others to generate ideas and/or complete the group’s work. A lack of shared leadership was connected to perceptions of less successful group experiences and less successful communication and collaboration. Markedly, some participants described assignment procedures that encouraged shared leadership, while others explained that their assignments required one student to act as leader. For example, in describing their group’s work on a marketing simulation assignment, Undergraduate Student 3 stated, “The computer has made me the leader, so I'm sort of doing the bulk of the work.”

Among the eight participants who reported a lack of shared leadership, seven also described the presence of free riding among members of their group. None of the participants who indicated that their group had had a shared leadership structure made any mention of behaviours associated with free riding. Free riding was much more prevalent among undergraduate student participants' groups than graduate student participants' groups; only one of the seven participants who described free riding among group members was a graduate student. Participants' responses indicated that having free riders in their groups often made the experience difficult for the group members who had to do more than their share of the work, and also damaged the group's motivation and cohesion. For example, when asked to describe their group's idea generation processes in later stages of their group's work, Undergraduate Student 8 shared,

> Now there are certainly shifts in motivation. It seems like when the group was formed everyone was trying to find their place, and once they realize that I was the most dedicated they took a backseat and just let me do most of the work…. I've also noticed that if one person in the group will say 'Oh, I've got to work,' or 'I'm busy, I can't meet at that time anymore,' then other people will say, 'Oh, I am too. I'll just add my part in later.'

All of the seven participants who indicated that others in their groups had engaged in free riding at some point during the assignment felt that it had a negative impact on the group experience overall, but that the effort of others in the group usually compensated for any potential deficits in cognitive and creative output. In fact, some participants indicated that they perceived an unequal distribution of work could be somewhat beneficial to their groups' work output. As Graduate Student 4 shared,

> Basically, there's just… the one or two people who have a lot of initiative are the ones who tend to draft a lot of those things before they become an issue and that's been a really big strength in our group. But it's also unfortunate because obviously a lot of the work falls to one or two people.

Notably, not all students in Graduate Student 4's group shared their feelings about the benefit of unequal work distribution. They went on to explain, "There is one student who feels like maybe their voice isn't being heard enough. Unfortunately, I think that also has to do with their participation in the project, or lack thereof." Perhaps tellingly, while seven participants indicated the presence of free riders in their groups, none of the participants indicated that anyone in their groups had engaged in production blocking, which, as explained in Chapter 2, is the practice of inhibiting others in the group from contributing (Paulus & Nijstad, 2003).

Efficiency and Effective Distribution of Work. Responses from eight participants indicated that completing their work efficiently was important to their definitions of success, and seven participants described effective distribution of work as a significant measure. All five graduate student participants valued efficiency, while only three of the eight undergraduate student participants included this concept in their definitions of success. Participants who perceived efficiency to be an important measure of success felt that an online environment was often more conducive to efficient group work than a face-to-face environment. As Graduate Student 1 described,

> Let's say that we are meeting for coffee, now we're just discussing, discussing, discussing, but there's no kind of… no one is taking notes in the meeting because you are talking to me and we're drinking a coffee, we are not recording anything,

> so we cannot revisit our conversation…. But if you are working digitally, it is more like, 'Okay, I just got off the call. I know the ideas on my mind, I will just go to the Word document, write my words, and that's it. My task is over.' Within 45 minutes the task is over. But if I would have gone over there to meet, it would have been like 2 hours and 45 minutes and the task would be still a work in progress.

Although participants connected efficiency to an overall successful online group work experience, they did not believe efficiency necessarily helped their groups be more creative and could serve to hinder their groups' creative success. Graduate Student 2 articulated this idea, explaining,

> Your day is controlled by Microsoft Teams, or Microsoft Teams and Outlook. So, yeah, if it's back-to-back, you don't really get the time to yourself to think and just sit with an idea. And this is where a creative idea comes out, so I think that's missing.

Distributing work effectively, which participants connected to their groups' abilities to work efficiently, was mentioned by four of the five graduate student participants, while only three of the eight undergraduate students defined success in this way. Participants recognized the strategy of dividing work based on individual strengths, an assertion of collective agency, as a means of fostering creativity. When asked if they thought their group was successful in coming up with good ideas, Graduate Student 2 explained,

> Probably, initially, the best idea was for everyone to stick to their thing. So, if you like policy you're going to do policy, if you like, sort of, business stuff you're going to do the business stuff, and if you like environment things, well, go look at

the trees. So, it's those different elements together that was probably a good idea and then it lets that person be a little bit creative within their own sphere.

Grades, Instructor Feedback, and Comparison to Other Groups. In addition to the internally measured definitions of success described above, participants included the external measures of assignment grades, instructor feedback, and comparison to other groups in their definitions of success. Getting good grades was among the most common definitions of success, with nine participants mentioning assignment marks as a factor that impacted their perceptions of success in online group work and creative group processes. Grades were especially important to undergraduate students, with seven of eight undergraduate student participants noting the importance of grades to their feelings of success. Notably, the three undergraduate student participants who had not received any marks from their instructors at the time of the interviews had some difficulty determining if they felt their groups had been successful. For example, Undergraduate Student 6 reported,

> It'll be interesting to see in the next coming, you know, I don't know, years, when we receive a mark back, to see, kind of, if the group says, 'Okay, like, clearly we didn't do that right.' Maybe the group members will change their way of thinking.

Only two of the five graduate student participants made any mention of grades as measures of their groups' creative success and indicated that grades were not as significant as other measures, such as effective communication and collaboration, and group cohesion.

Eleven participants indicated that their perceptions of success were partially dependent upon feeling that they were meeting their instructors' expectations. In order to

have a sense of success in this area, participants felt clear expectations had to have been set by the instructor and that they needed to have received timely feedback and/or responses to requests for clarification. The eight participants who indicated that their instructors had provided clear assignment guidelines or who had responded promptly to emails or Teams messages asking for guidance believed that their groups were equipped to meet expectations, and that doing so was an important component of overall success. As Graduate Student 1 explained,

> We had a midterm check in with our professor and we had to, kind of, show our work plan. And he was really appreciative of the way that we have structured our approach and the milestones that we have decided are basically 15 days before the main project is to be submitted. So, he really appreciated how exactly we have thought through the whole process.

On the other hand, the three participants who reported significant issues in communicating with their instructors indicated that this made it difficult for them to measure their groups' success.

Of the six participants who noted that they defined success in relation to the work of other groups in their classes, three were engaged in group marketing simulation assignments using a software application that displayed each group's weekly sales and class rank, encouraging such a comparison. Participants engaged in these simulation assignments relied heavily on these weekly rankings to measure their success, and typically perceived this measure to be more important than effective communication and collaboration or group cohesion. For example, Undergraduate Student 5 shared,

> I honestly do think we've been successful in coming up with good ideas considering, like, you can see how well you're doing in different categories and sectors and everything, and so far, we've been in, like, the top two positions of our simulation. So, I think what we're doing is effective so far and I think we're doing pretty okay. From, like, a partner perspective it's not as successful, but obviously something's working or something's going right because we are doing well.

Another participant who based perceptions of success in part on comparison to other groups was in a course for which the instructor posted each group's assignment publicly, also inviting comparison. The two remaining participants who included comparison to other groups in their definitions of success were both graduate students participating in experiential, semester-long group assignments. Their comments related to this particular definition of success were based on rumours regarding how well other groups worked together. For example, Graduate Student 2 stated, "Through the grapevine, I've heard about other groups and they seem like disasters."

Generation of Novel and Useful Ideas. Notably, despite the fact that participants were directly asked about their groups' abilities to come up with good ideas, only three participants included the generation of novel and useful ideas in their definitions of success. However, all participants felt that it was important to generate enough ideas to complete the assignment. Ten participants described feeling that idea generation was only significant to the extent that it related to their groups' abilities to meet assignment requirements, and that finding unique and/or useful ideas was relatively unimportant. Four participants felt that their groups would have been able to produce more ideas and

better ideas if they had been able to engage in group brainstorming in a face-to-face environment.

Other Definitions of Success. Participants included several other concepts in their definitions of success. Five participants specifically mentioned getting the assignment completed as an important minimum requirement for a successful group experience, and four reported that submitting work on time was significant. Four participants mentioned group effort as a key component of a successful group experience, two participants noted that professionalism was significant, and two participants mentioned the quantity of their group's work output as important. One participant repeatedly mentioned that networking and building lasting relationships with group members was the most significant measure of success in a group work experience; however, no other participants stated this view.

4.3.3 Summary of RQ3 Findings

Overall, participants' responses indicated they believed they possessed the necessary competencies to succeed at group work, and that their own contributions to group assignments typically demonstrated creativity and originality when assignments were structured in such a way as to make this possible. Findings demonstrate that participants' perceptions of success in group work and group creativity in an online environment were closely connected to group dynamics, such as effective communication and collaboration, group cohesion, efficiency and effective distribution of work, as well as external factors, including grades, instructor feedback, and comparison to other groups. While graduate student participants tended to focus more on group dynamics, undergraduate student participants tied their perceptions of success more closely to external factors. Although most participants recognized the importance of idea generation

in order to complete assignment tasks, most did not connect generating novel and useful ideas to their perceptions of success. Participants perceived there to be inherent barriers presented by carrying out their group work in an online environment and believed that they were largely unable to mitigate these barriers through any personal or collective actions.

Chapter 5: Discussion

This chapter presents a synthesis of findings for each of the three research questions that guided this study. While findings from the analysis of data gathered using the survey questionnaire are general in nature, findings from the analysis of interview data are detailed and nuanced. As such, findings are compared to identify commonalities and dissimilarities, but many of the findings from the analysis of interview data do not have points of comparison within findings from the survey data. This is mostly due to the nature and purpose of each data collection instrument, as they were designed to collect data to differing degrees of granularity. However, situating the synthesis of findings within the prior research described in Chapters 2 and 3 helps compensate for this.

Sections 5.1, 5.2, and 5.3 are devoted to the discussion of the three research questions that have guided this study and the identification of key findings concerning each question. Section 5.1 provides an overview of the preferences and beliefs of university students regarding group work and group creativity. The following section, 5.2, explores the ways in which university students participate in online group work and online creative group processes, and section 5.3 examines specific factors that appear to influence university students' perceptions of success in group work and creative group processes in an online educational environment. Section 5.4 provides a summary of the synthesis. Perhaps most significantly, a blended theoretical framework has emerged through the synthesis of findings from this study and prior research, as explained in section 5.5. This blended theoretical framework offers a meaningful contribution to the study of students' experiences engaging in creative group processes in an online

environment by combining elements of the four theoretical constructs that have informed this study with contextual factors demonstrated to be influential.

5.1 What Are the Preferences and Beliefs of University Students Regarding Group Work and Creative Group Processes?

The findings of this research study indicate that university students have a general aversion to group assignments, and that they attribute an increased level of difficulty and frustration to participating in group assignments in an online educational environment. As Marzano (2007) explained, participating in purposefully designed and facilitated group assignments can positively contribute to students' learning; university students appear to be aware of this benefit of engaging in meaningful group work. Although participants in this study expressed a general dislike for group assignments, they did recognize that there are benefits to group work, and that participating in group assignments can help them develop skills they will likely call upon in their future careers.

Supporting Burdett's (2003) findings, this research suggests university students believe problems presented by group assignments typically include an unequal distribution of effort among group members resulting in difficulty developing trust, logistical difficulties (e.g., finding meeting times that work for all group members), and a lack of appropriate support from instructional staff. This research indicates university students believe these problems are exacerbated by the online environment, especially when group members are not co-located. Factors related to physical, temporal, and perceived distance noted previously by Morrison-Smith and Ruiz (2020) were seen by participants as barriers to engaging in group work and creative group processes online. Participants in this study also demonstrated a preference for choosing their own group

members when they knew others in their courses, which can be seen as an expression of personal agency (Bandura, 2001), and aligns with findings from previous studies (e.g., Shimazoe & Aldrich, 2010). This research indicates that this preference is especially strong for students engaged in online group work, and that university students believe choosing to work with people with whom they have preexisting relationships can make the processes of establishing procedures and dividing tasks among group members more efficient and can mitigate the perceived lack of accountability of the online environment.

The findings of this research study also support the assertions of Garrison et al. (2000) regarding the importance of social presence, cognitive presence, and teaching presence in shaping students' online educational experiences. This research indicates that university students believe the online environment makes it more difficult to develop relationships and communicate with others, which presents barriers to engaging in the collaborative cognitive processes necessary for group creativity. University students typically believe "generating ideas and sharing views" (Burdett, 2003, p. 183) is one of the most important benefits of working in a group; however, this research study suggests that students believe this benefit is missing or greatly diminished in an online learning environment. Participants' responses also suggest that university students believe the role of the course instructor is amplified in an online environment, as they are more reliant upon instructors to design and facilitate their learning and group work experiences than they would be in a face-to-face setting in which they could more easily interact with peers.

This research also indicates university students believe that factors related to carrying out group work in an online environment, such as the perceived awkward nature

of online communication, issues getting to know their group members, and an increase in free riding, hinder their ability to engage in creative group processes, and that these same factors contribute to an absence of enjoyment in their work. While this research has not shown (or attempted to show) a correlation between group creativity and enjoyment, prior creativity research has indicated that people typically find the most enjoyment from discovering or creating something new (e.g., Csikszentmihalyi, 1996), which suggests the two may be connected. Additionally, as Haigh (2007) noted, face-to-face students typically report feeling partially dependent upon class discussions to motivate their learning, which are often missing or occur in text-based discussion boards in an online environment. This research study indicates that without these opportunities for somewhat spontaneous conversation, university students may feel less enthusiastic about their courses and their group work and may believe it is more difficult to engage in creative group processes.

5.2 How Do University Students Engaged in Group Work Participate in Creative Group Processes in an Online Environment?

As Kozlowski and Bell (2003) explained, groups are expected to perform and manage many processes to meet their goals. Groups do not exist in a vacuum; they must work within the structures of larger systems, which offer both supports and constraints. For student groups carrying out their work online, the structures that support and constrain their work are not only those presented by their universities and created by their course instructors but also those presented by the technological tools they use. According to Morrison-Smith and Ruiz (2020), collaborative technological tools can help virtual groups overcome some of the cognitive, social, and emotional challenges they typically

face. This research study indicates that university students engaged in online group work use a variety of technological tools, including professional tools and social media applications and/or mobile phone technology, to participate in creative group processes, and that some of these tools allow student groups to overcome challenges to the degree necessary to complete their work.

While past research concerning group creativity has mainly focused on the circumstances surrounding and methods used during the idea generation process (e.g., Nijstad et al., 2006), results from the current study indicated that the idea generation process is intertwined with other group processes, which aligns with findings from the broader groups research (e.g., Toze, 2014). This includes the task-related processes of information seeking, information sharing, decision making, and idea connection, as well as procedural and interpersonal processes. Rather than deliberate attempts at idea generation, university students seem to engage in an iterative idea generation process that is continually shaped by the introduction of new information, either gathered from outside sources or constructed by the students themselves. Although prior research has demonstrated that collaborative information seeking is often more effective than independent information seeking (Gonzalez-Ibanez et al., 2011), findings from the current study support research indicating students typically do not seek information collaboratively, but share information frequently (O'Farrell & Bates, 2009). The current study suggests that university students engaged in online group work share information in many different ways, as demonstrated by the variety of approaches described by study participants, from simply posting text-based information to a shared online document to preparing formal presentations delivered during weekly synchronous video meetings.

According to the Community of Inquiry framework presented by Garrison et al. (2000), because learning involves an interaction between one's personal, reflective world and one's shared, knowledge-focused world, "cognition cannot be separated from the social context" (p. 92). In accordance with this framework, this research study suggests that not only are groups' task-related processes intertwined with each other, their procedural and interpersonal processes also shape and inform their creative processes. Specifically, procedural processes related to virtual communication, and interpersonal processes connected to proxy and collective agency, appear to play a part in how university student groups participate in creative group processes in an online environment. Although university students seem to typically determine procedural and interpersonal processes for their groups' work, they do not appear to discuss plans for carrying out task-related processes, instead relying on loose, informal structures as explained by Bernier & Stenstrom (2016). This appears to be linked with a general difficulty reflecting on these processes. Furthermore, although previous studies have demonstrated the benefits of explicitly determining procedures when working as part of a group (e.g., Bernier & Stenstrom, 2016), this study indicates there is no clear belief among university students as to the necessity of doing so. This study suggests that university students may not be aware of research demonstrating the benefits of determining procedures for group work, or that when not required to create team charters as part of their assignments, they may not feel comfortable expressing the agency necessary to do so when working with relative strangers, especially in an online environment.

5.3 Are There Specific Factors That Influence University Students' Perceptions of Success in Group Work and Creative Group Processes in an Online Environment?

Findings from this study support those of previous research, which indicated that many internal and external factors influence student groups' perceptions of success in carrying out creative processes and completing their work. These include internal group dynamics, such as group leadership structure (Lee et al., 2015) and a group's sense of closeness (Oztop et al., 2018), along with external factors, such as grades and feedback from instructors (Burdett, 2003). This study suggests university students perceive there to be additional barriers to achieving success in group work and group creativity presented by the online environment that would not apply in a face-to-face setting. Findings concerning internal factors and external factors are discussed in the two subsections below, respectively.

5.3.1 Internal Factors

Effective communication and collaboration are essential for a group's success in creative group processes regardless of setting (McGrath et al., 2000), but, as Morrison-Smith and Ruiz (2020) noted, communication and collaboration are especially influential for groups engaged in these processes in an online environment. The current study supports this, as effective communication and collaboration were viewed by participants as essential to their group's success. Unlike groups working in a face-to-face setting, virtual groups are dependent upon text-based and/or video communication to carry out their work. As Garrison et al. (2000) explained, online text-based communication typically includes lags in response times, an absence of spontaneity, and a lack of nonverbal cues, which can lead to difficulty engaging in social and cognitive processes.

This research study indicates that text-based communication does indeed present barriers for students engaged in online group work, and that communicating using video conferencing tools can only partially make up for these inadequacies, as Morrison-Smith and Ruiz (2020) suggested they could.

Problems associated with ineffective online communication and collaboration identified in this research study include difficulty developing interpersonal relationships with group members, difficulty depending on others to contribute to the groups' work, and an inability to appropriately address conflict. These problems appear to affect university students' perceptions of success, as they inhibit a group's ability to work together cohesively and develop a sense of closeness, which has been shown to lead to higher group creativity (Oztop et al., 2018), as well as a group's likelihood of developing a shared leadership structure, which has been shown to improve a group's creative output (Lee et al., 2015). Interestingly, although past research examined for this study does not seem to have identified the following phenomenon, interview participants in this study perceived conflict avoidance as an effective means of ensuring their groups' overall success. This indicates that university students may exercise agency through inaction as well as action.

Groups' abilities to communicate and collaborate effectively are also connected to their abilities to carry out creative processes, although university students do not seem to perceive this as a significant issue. Findings from this research study indicate that although university students may not explicitly discuss task-related processes, they seem to engage in independent idea generation, group brainstorming, or a combination of both. A third approach, idea generation in nominal groups, has been identified as leading to the

production of more ideas and better ideas than engaging in brainstorming or independent idea generation (Diehl & Stroebe, 1987; Diehl & Stroebe, 1991; Miller, 2009; Nijstad et al., 2006; Rietzschel et al., 2006; Henningsen & Henningsen, 2013); however, university students do not seem to engage in this approach. Nevertheless, this research study suggests that university students believe they are successful in coming up with creative, original contributions to group work, and that they seem to believe brainstorming is an effective technique for idea generation, a belief that is commonly held among the wider population (Nijstad et al., 2006). This study also suggests that university students do not experience difficulties with information seeking or sharing in a way that influences their perceptions of success. Notably, this study did not identify the presence of information withholding as a strategic behaviour as demonstrated by prior research (de Vreeze & Matschke, 2017; Steinel et al., 2010), though it is unclear if this has more to do with the methods of data collection than an actual absence.

Despite an apparent confidence in their own creative abilities and faith in the brainstorming process, university students do not seem to believe the generation of novel and useful ideas is important for a group's overall success. Rather, they appear to value their groups' abilities to connect ideas and build on them, which seems to support the research of Rietzschel et al. (2006), who found that production alone is not necessarily the best way to measure a group's creative success. This finding could also be an indication of idea fixation, also known as groupthink (Harris, 1994). Whatever the underlying cause, this study suggests that university students' perceptions of success in creative group processes are more closely tied to their ability to effectively share

information and generate enough ideas to complete assignments than to find the most creative solutions to assignment tasks.

5.3.2 External Factors

The need for creativity may be innate as Csikszentmihalyi (1996) posited, but it is also quite often contingent upon being presented with circumstances requiring novel discovery or thought (Zhou & George, 2001). For student groups, these circumstances are largely dictated by the course instructor. This research study lends support to past research demonstrating the essential role of the university course instructor in designing cooperative learning activities that include clear expectations and processes for monitoring and supporting groups throughout their work, help students develop social skills, and help groups establish goals and procedures, and in providing timely guidance and feedback (Shimazoe & Aldrich, 2010). In fact, university students' perceptions of success in group work and group creativity in an online environment seem to be highly influenced by their instructors' design and facilitation of the course and assignments, especially the level of flexibility communicated to students through assignment guidelines.

Although previous studies have indicated that problem-based assignments, such as simulations or experiential learning opportunities, can foster student creativity (Lee et al., 2019; Lloyd, 2012), findings from this study suggest that creative output is more dependent upon being presented with a moderate, flexible level of support than a specific type of assignment. This research study also indicates that designing group work assignments that present opportunities for creativity within clearly established yet flexible structures is especially important in an online environment as they help alleviate some of

the barriers perceived by university students to be inherent in online group work. Interestingly, several previous studies (e.g., Chang, 2011) have shown that, under certain conditions, virtual groups can be more creative and perform better than face-to-face groups. These conditions include structured, mediated interactions (Chang, 2011; Sousa et al., 2014) and a centralized system of informing group members of the contributions of others (Michinov & Primois, 2004). This study indicates that for student groups, responsibility for creating and facilitating the necessary structures, systems, and mediation often falls to the course instructor, as students do not typically possess the personal or collective agency to create these conditions for themselves and must instead express proxy agency by trusting the course instructor to do so for them. In addition, findings from this study confirm Draper's (2015) assertions that instructors transitioning face-to-face courses to an online environment must reconceive learning activities and assessments to adapt to the new environment, as participants who engaged in group assignments for which the instructor made significant adaptations to accommodate for the online setting were better equipped to successfully navigate online group work and felt more successful overall.

University instructors also play an important role in helping students develop social skills and helping groups establish goals and procedures when engaged in group work (Bernier & Stenstrom, 2016; Burdett, 2003; Carter et al., 2018; Shimazoe & Aldrich, 2010). Although Garrison et al. (2000) explained that the functions of teaching presence "may be performed by any one participant in a Community of Inquiry" (p. 89), findings from this research indicate that the design and facilitation of learning activities is perceived by university students to be the domain of the course instructor. Findings from

this study indicate this role is even more important for involuntary online students participating in group work in an unfamiliar online environment, and that the skills required to participate in online group work are indeed, as Saghafian and O'Neill (2018) explained, different than those needed to do so face-to-face. In addition, this study indicates that university students are able to carry out communicative and collaborative processes more effectively when their instructors also engage in and model appropriate online communication, as previously suggested by Larson et al. (2019) and Garrison et al. (2010), among others.

This research study aligns with past research indicating that university students perceive themselves to be more successful in participating in group work and creative group processes in an online environment when their course instructors respond promptly to requests for clarification, check in with students throughout their group work experiences, and provide prompt assignment feedback (Burdett, 2003; Colbeck et al., 2000; Shimazoe & Aldrich, 2010). Unsurprisingly, participants in this study who experienced a minimal level or a near absence of teaching presence had difficulty evaluating their groups' overall success, while those who engaged frequently and collaboratively with instructional staff felt better equipped to determine their groups' success. As West (2002) explained, groups are typically more creative when they feel safe and free from pressure. This research study indicates that part of establishing a safe, pressure-free learning environment is acknowledging student communications, such as emails, and confirms that taking groups' feedback seriously and discussing it with students fosters a cooperative learning environment (Shimazoe & Aldrich, 2010).

5.4 Summary of Synthesis

Factors that have been previously identified by university students as the worst aspects of group work, including "unequal distribution of effort, difficulties of accommodating different work schedules for meeting times, (and) lack of staff support" (Burdett, 2003, p. 184), seem to be aggravated by the online learning environment. University students also appear to believe working in groups online typically leads to less collaboration with group members than they would expect in a face-to-face setting, and that this is detrimental to their groups' creative success. Choosing group members, however, appears to be seen by university students as a way to remedy this situation, in that it decreases the need to develop social presence and foster interpersonal relationships, and gives students a sense of control over their experiences.

University students typically use a combination of professional technological tools, as well as social media and/or mobile phone technology, to engage in group work and creative group processes in an online environment. The study indicates that the idea generation process is not only inextricable from the processes of seeking and sharing information, making decisions, and connecting ideas, but is also connected to interpersonal and procedural processes. However, university students do not explicitly discuss how they will carry out most creative group processes, and may not be aware of the benefits of having these discussions, or may not possess the agency to manage these discussions without instructor support.

This study indicates that internal and external factors influence university students' perceptions of success in group work and group creativity in an online environment. A group's ability to engage in effective communication and collaboration

are perceived to be essential for success regardless of setting but especially in an online environment. University students who depend on text-based communication appear to feel less successful in participating in online creative group processes than those who also use video conferencing tools; however, none of the available technological tools are perceived to compensate for face-to-face conversation. Although the generation of novel and useful ideas has been used in past research to measure group creativity (e.g., Diehl & Stroebe, 1991), this research indicates university students value their groups' ability to cohesively adapt and augment initial ideas rather than generate a large quantity of ideas. University students' perceptions of success in online group work are closely tied to the actions of their instructors in designing and facilitating the course and assignment. This research supports recommendations made by previous researchers (e.g., Shimazoe & Aldrich, 2010) regarding steps instructors should consider when designing and facilitating collaborative learning experiences, and expands upon these recommendations by suggesting additional considerations that apply for group work and creative group processes carried out in an online environment.

5.5 A Blended Theoretical Framework

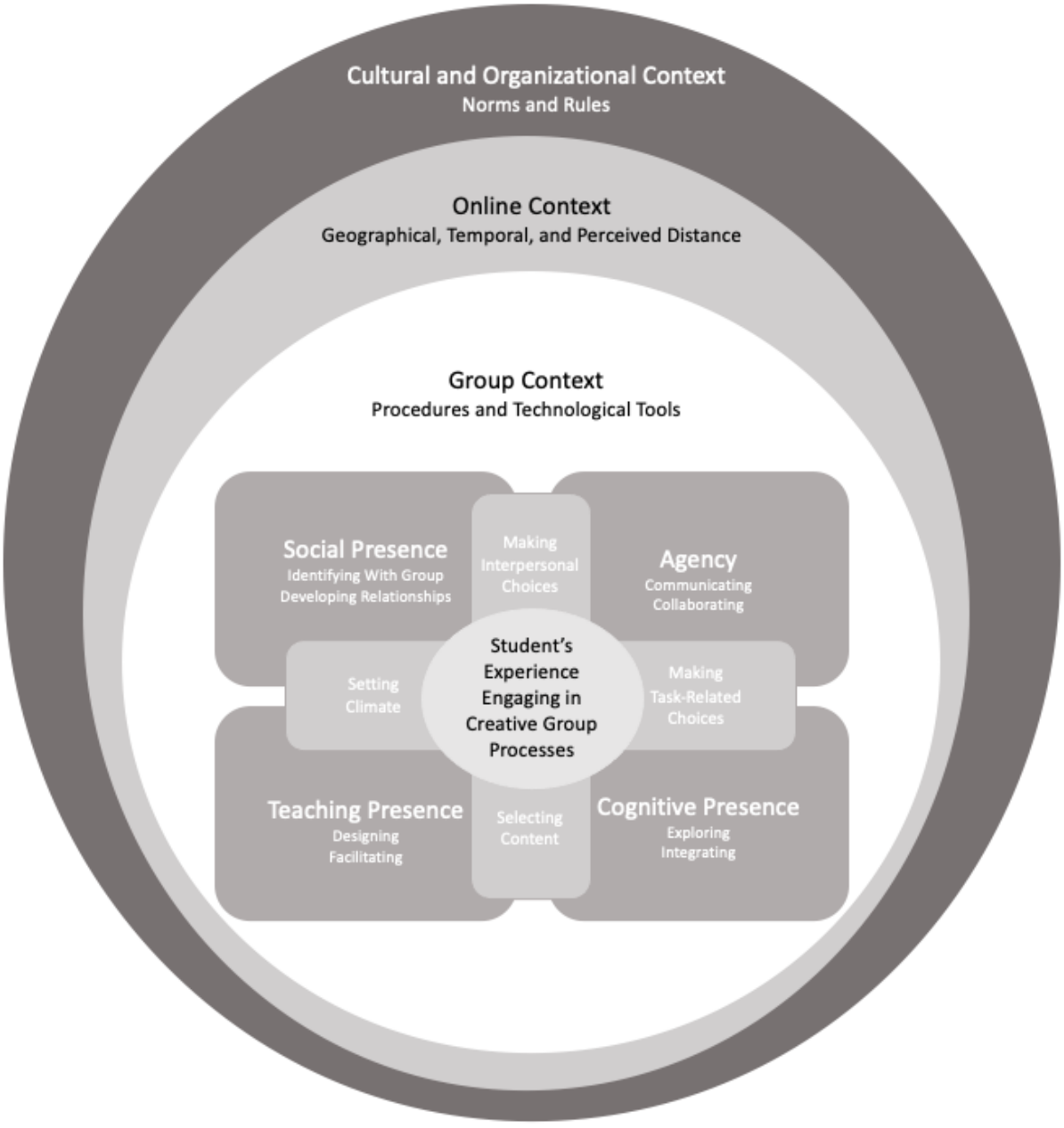
A blended theoretical framework incorporating the Community of Inquiry model (Garrison et al., 2000), Bandura's Social Cognitive Theory of Agency (2001), and central components of social constructivism and Sensemaking, has emerged through this research study as a method of understanding students' experiences engaging in creative group processes in an online environment. As explained in Chapter 3, over the last 20 years (Castellanos-Reyes, 2020) researchers have proposed modifications to the CoI framework to account for various factors that learners bring to their online educational

experiences, such as emotions, attitudes, abilities, and behaviours. Despite these suggestions, none of the proposed changes have been widely adopted; rather, definitions of social presence and, to a lesser extent, teaching presence have been refined to account for these and other factors (Shea et al., 2014). Indeed, the CoI framework may very well be sufficient as it is to understand students' general experiences as part of an online Community of Inquiry. The blended theoretical framework that has emerged from this research study does not attempt to replace the CoI framework. In fact, this research indicates that cognitive presence, social presence, and teaching presence do indeed intersect to inform a student's online educational experience as Garrison et al. (2000) explained, but that students' direct personal agency, proxy agency, and collective agency are especially important in shaping students' experiences engaging in creative group processes in an online environment. These types of presence and expressions of agency are situated within multiple layers of context, which affect the ways in which an individual makes sense of and engages in online creative group processes and their preferences, beliefs, and perceptions of their experiences. A diagram of this blended framework is provided in Figure 3, below.

While the CoI framework illustrates the link between social presence and cognitive presence as "supporting discourse" (Garrison et al., 2000, p. 88), this blended framework displays agency as the link between social presence and cognitive presence for students engaged in creative group processes in an online environment, and as just as significant as the three types of presence. Students engaged in creative group processes in an online environment demonstrate agency through the interpersonal choices they make

Figure 3

Blended Theoretical Framework: A Student's Experience Engaging in Creative Group Processes in an Online Educational Environment



to influence or trust others, such as choosing to address or avoid conflict. They also express agency through the task-related choices they make, such as choosing to integrate their ideas with those of their group members or choosing to voice divergent thoughts. These interpersonal and task-related choices can take the form of direct personal agency, proxy agency, and/or collective agency depending on circumstances related to social presence, cognitive presence, and teaching presence. For example, if, through social presence, groups have established strong group cohesion, they may be better equipped to exercise collective agency and advocate as a group. Though the CoI framework includes elements of agency within social presence (e.g., expressing opinions) and cognitive presence (e.g., connecting ideas), this blended framework is constructed in such a way as to emphasize that expressions of agency are as important to a student's experience engaging in creative group processes as social presence, cognitive presence, and teaching presence.

The four overlapping components of an individual's experience engaging in creative group processes in an online environment are influenced by the supports and constraints of the cultural and organizational context (Kozlowski & Bell, 2003), the types of distance presented by the online context (Morrison-Smith & Ruiz, 2020), and the group context, including procedures and technological tools used to carry out the group's work (Tannenbaum et al., 2012). Each of these layers of context shape the ways in which an individual makes sense of their experiences (Dervin, 1998) and constructs meaning (Creswell & Poth, 2018). Within the group context, students determine and/or follow procedures that dictate their procedural, task-related, and interpersonal processes. They must also understand and effectively use technological tools to carry out their work. The

online context includes geographical distance, temporal distance, and perceived distance. Each of these types of distance can present barriers for students engaged in creative group processes in an online environment, which vary in significance depending on the particular group composition and dynamics. The cultural and organization context includes the culture of the course and the institution as well as the dominant culture of the region in which the organization is physically located, each of which present written rules and unwritten norms. Placing the central diagram of social presence, cognitive presence, teaching presence, and agency within the concentric figures of group context, online context, and organizational context illustrates the complexity of the worlds each student must navigate in order to successfully engage in creative group processes in an online environment.

This blended theoretical framework encapsulates the complexity of an involuntary online student's experience participating in creative group processes in an online educational environment. Though the CoI model provides a simple yet elegant framework instructors can apply as they plan and teach online courses, the design and facilitation of online group assignments intended to foster communication, collaboration, and creativity seems to require a more complex theoretical framework to account for the significance of presence, agency, and context in shaping students' experiences engaging in these assignments and associated processes.

Chapter 6: Conclusion

To conclude this thesis, this chapter summarizes theoretical contributions of this research in section 6.1 and practical contributions in section 6.2. Limitations to this research study are explained in section 6.3, and suggestions for future research are detailed in section 6.4.

6.1 Theoretical Contributions

Studying university students' preferences, beliefs, and perceptions has clarified that in addition to presence, students depend on expressions of agency to feel successful in participating in creative group processes in an online environment. This study has confirmed the work of Garrison et al. (2000) and the many other researchers who have applied the Community of Inquiry framework to the study of students' online educational experiences over the last twenty years, and has also incorporated the Social Cognitive Theory of Agency (Bandura, 2001) to understand the experiences of university students as they relate to online creative group processes, specifically. This study has confirmed that students' complex experiences in this area shape their beliefs and perceptions as they construct meaning (Creswell & Poth, 2018) and make sense of the world around them at a given point in space and time (Dervin, 1998).

Studying the experiences of individual students engaged in group work has also contributed to research into groups more generally. Much of this prior research focused on studying groups as complex, dynamic systems (e.g., McGrath et al., 2000), which they certainly seem to be. However, by examining the experiences of the individual within the group system as well as within larger systems, this study has contributed to an

understanding of why group systems and processes are so complex. The blended theoretical framework that has emerged from this study is meant to illustrate the factors that shape the experience of a single student engaged in creative group processes in an online environment. When working as part of a group, however, the experiences of each individual in the group intersect. Imagining the central component of the illustration provided in Figure 3 multiplied, overlapping and intersecting many times within the cultural and organizational, online, and group contexts makes it easy to understand just how complex group systems really are and why they are so complicated to study.

6.2 Practical Contributions

The theoretical model that has emerged from this study also allows for the identification of practical implications of this research. Findings from this study are beneficial for all involved in online university courses, especially students and instructors. Understanding the many factors that potentially shape their own online group work experiences can help students reflect and adapt their approaches to engaging in such experiences. Students can also benefit by understanding how they can express personal, proxy, and collective agency to improve their experiences participating in creative group processes in an online educational environment.

This research has confirmed the critical importance of the university course instructor in designing and facilitating group work experiences as explained by Burdett (2003), Colbeck et al. (2000), Marzano (2007), Shimazoe & Aldrich (2010), and others. Additionally, this research emphasizes the increased significance of this role for online courses, which previous research (Draper, 2015; Garrison et al., 2010; Stodel et al., 2006; Sung & Mayer, 2012; Wei et al., 2012) has also shown. This study has confirmed that

when course instructors design assignments with clear expectations and explain the rationale for working in a group to complete the assignment, discuss the benefits of setting goals and determining procedures and assist student groups in doing so, facilitate group interactions and model appropriate communication, and provide timely responses to communication and targeted feedback, student groups are more successful and more satisfied with their creative output. A list of recommendations for instructors concerning the design and facilitation of online group assignments based on the extant research and findings from this thesis is provided in Appendix I.

This research also suggests that instructors may need to explain the benefits of nominal group idea generation and collaborative information seeking and assist students in participating in these processes, as they seem to be unaware of the benefits, unsure of how to engage in these processes, or a combination of both. In addition, this research supports recommendations of previous research regarding the necessity of instructors' design of specific structures that foster creative group processes in an online environment, such as creating structured, mediated interactions for students engaging in group work (Chang, 2011; Sousa et al., 2014). Training targeted towards university instructors transitioning to an online teaching environment may benefit from incorporating these findings regarding purposefully designed and thoughtfully executed cooperative learning experiences.

6.3 Limitations

This study was limited by factors related to data collection and analysis. First, both the survey and the interviews employed a voluntary response sampling method, relying on interested students to volunteer to participate. This method does not ensure a

representative sample, and students who had strong opinions may have been more eager to participate than those who did not. In addition, a screening tool would have been useful in selecting participants for the semi-structured interviews, as this could have helped ensure participants were engaged in group assignments that required a significant investment of time and effort, and would therefore likely have rich, detailed experiences to share.

As mentioned in Chapter 2, idea fixation, production blocking, and evaluation apprehension can present barriers to creative group processes in addition to the free riding identified in this study (Diehl & Stroebe, 1987; Diehl & Stroebe, 1991; Paulus & Nijstad, 2003). Notably, findings from the current study did not indicate the presence of any of these other phenomena. Their absence from participants' reports, however, does not signify an absence from their groups' experiences. Rather, participants may have made sense of their own experiences by identifying others as free riders but may have been perceived by the alleged free riders to be overly judgmental or stubborn, thus leading to evaluation apprehension or production blocking. In fact, all interview participants described being satisfied with their own contributions to group work, and only one of the thirteen participants admitted to engaging in any behaviour that they recognized as detrimental to their group's success, and only a minor one. Taking steps to recruit multiple participants from within the same group could have helped develop a better understanding of potential biases of interview participants.

6.4 Suggestions for Future Research

Future research concerning university students' preferences, beliefs, and perceptions of group work and creative group processes in an online environment could

explore the role of the course instructor in more detail by involving instructors in the research process. Through design-based research, instructors could be involved in designing and facilitating group work experiences according to the recommendations outlined in this thesis and supported by prior research, with the goal of measuring how students' experiences are influenced by the instructors' actions.

In addition, further research focused on gaining a deeper understanding of how and why university students express agency when involved in creative group processes in an online environment would help evaluate the efficacy of the blended theoretical framework that has emerged from this study. Especially interesting to examine would be students' expressions of agency through inaction, such as by choosing to avoid conflict or choosing to allow more dominant members of the group carry out the work. This study, like others before it, has uncovered students' perceptions of free riders among their groups, but has failed to gather data from a free rider themself. It could be useful to find out more about the preferences, beliefs, and perceptions of students whom others have deemed lazy to attempt to discover potential causes for their lack of motivation and engagement, and seeming lack of concern for the success of the group overall.

Finally, further research focused on evaluating the blended theoretical framework proposed in this thesis should be conducted in the future. This could help ensure its validity as well as measure its potential applicability to aspects of online group work beyond creative group processes. Additionally, studying the experiences of students engaged in group assignments outside of the field of management could allow for the evaluation of this framework as a means of understanding a wider variety of experiences than those examined in this study.

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Appendix A: Survey Recruitment Document

DALHOUSIE UNIVERSITY
FACULTY OF MANAGEMENT

Dear Students,

My name is Rachel Moylan, and I am a graduate student in the Master of Information program at Dalhousie University. I would like to invite you to take part in a study called "Creative group processes in a remote educational environment." I invite you to complete a short survey which is expected to take less than 10 minutes to complete. You are eligible to complete this survey if you are a student taking at least one course at Dalhousie University in the Fall 2020 semester.

Participation in this study is completely anonymous and voluntary. At the end of the survey, you can choose to provide your email address to be entered in a drawing for one of three $50 gift certificates to Amazon.ca. Results from this survey may be shared with Dalhousie professors and may help instructors and students plan and carry out group assignments more effectively in the future. Participating in the study and sharing your experiences with group work in the Fall term will in no way impact your academic standing or your relationship(s) with group members.

If you are interested in participating, please click the following link to the survey delivered using the Qualtrics platform:

https://corexmsgfnvwvvf64ttw.ca1.qualtrics.com/jfe/form/SV_6R83I8n4HsN0fuB

Sincerely,

Rachel Moylan
MI Candidate, 2021
rachel.moylan@dal.ca

Supervisors:
Dr. Sandra Toze
School of Information Management, Dalhousie University
sandra.toze@dal.ca

Dr. Colin Conrad
School of Information Management, Dalhousie University
colin.conrad@dal.ca

Appendix B: Interview Recruitment Document

DALHOUSIE UNIVERSITY
FACULTY OF MANAGEMENT

Dear Students,

My name is Rachel Moylan, and I am a graduate student in the Master of Information program at Dalhousie University. I would like to invite you to take part in a study called "Creative group processes in a remote educational environment."

I would like to invite you to participate in an interview with me about your experiences participating in group work remotely during the Fall 2020 semester. The time commitment for participation is approximately 40 minutes. You are eligible to participate if you are a student taking at least one course at Dalhousie University in the Fall 2020 semester that includes at least one group assignment.

Participation in this study is completely voluntary and you will be compensated with a $15 gift certificate from Amazon.ca for your time. Summarized results from this survey may be shared with Dalhousie professors and may help instructors and students plan and carry out group assignments more effectively in the future.

Should you choose to participate, your responses will be kept anonymous. Participating in the study and sharing your experiences with group work in the Fall term will in no way impact your academic standing or your relationship(s) with group members.

If you are interested in participating, please contact me at rachel.moylan@dal.ca.

Sincerely,

Rachel Moylan
MI Candidate, 2021
rachel.moylan@dal.ca

Supervisors:
Dr. Sandra Toze
School of Information Management, Dalhousie University
sandra.toze@dal.ca

Dr. Colin Conrad
School of Information Management, Dalhousie University
colin.conrad@dal.ca

Appendix C: Survey Screening and Consent Procedures

DALHOUSIE UNIVERSITY
FACULTY OF MANAGEMENT

You are invited to take part in a research study being conducted by Rachel Moylan, a graduate student in the School of Information Management at Dalhousie University under the supervision of Dr. Sandra Toze and Dr. Colin Conrad. The purpose of this research is to study how students feel about participating in group work, especially the process of generating new ideas as part of a group. To investigate this question, we have developed a questionnaire. You can participate in this questionnaire if you are currently enrolled in a university course at Dalhousie University which involves group work

If you choose to participate in this research, you will be asked to answer 30 questions about your perceptions of group work and its impact on creativity. The questionnaire responses are anonymous, and I expect that this questionnaire will take less than 10 minutes to complete.

Your participation in this research is entirely your choice. You do not have to answer questions that you do not want to answer (by selecting prefer not to answer), and you are welcome to stop the survey at any time if you no longer want to participate. All you need to do is close your browser. I will not include any incomplete surveys in my analyses. If you do complete your survey and you change your mind later, I will not be able to remove the information you provided as I will not know which response is yours.

Your responses to the survey will be anonymous. This means that there are no questions in the survey that ask for identifying details such as your name or email address. All responses will be saved on a secure Dalhousie server. Only Rachel Moylan, Dr. Sandra Toze, and Dr. Colin Conrad will have access to the survey results.

Participating in the study and sharing your experiences with group work in the Fall term will in no way impact your academic standing or your relationship(s) with group members.

I will describe and share general findings of this research in my thesis and/or scientific journals. My supervisors will keep the anonymous survey information indefinitely as it may be used in future research.

The risks associated with this study are no greater than those you encounter in your everyday life.

After-completing the survey, you can choose to provide your email address to be entered in a drawing to win one of three $50 gift certificates for Amazon.ca. If you choose to provide your email address, it will not be linked to your survey responses and will only be used for the purposes of the gift certificate drawing. The research might also contribute to new knowledge on how to improve virtual university group work.

You should discuss any questions you have about this study with Rachel Moylan (rachel.moylan@dal.ca) or Dr. Sandra Toze (sandra.toze@dal.ca) or Dr. Colin Conrad (colin.conrad@dal.ca). Please ask as many questions as you like before or after participating.

If you have any ethical concerns about your participation in this research, you may contact Research Ethics, Dalhousie University at (902) 494-3423, or email ethics@dal.ca (and reference REB file # 2020-5235).

If you agree to complete the survey, please click the link below:

[link]

Appendix D: Interview Screening and Consent Procedures

DALHOUSIE UNIVERSITY
FACULTY OF MANAGEMENT

Project title:

Creative group processes in a remote educational environment

Lead researcher:

Rachel Moylan, Master of Information Candidate, School of Information Management, Dalhousie University, rachel.moylan@dal.ca

Supervisors:

Dr. Sandra Toze, School of Information Management, Dalhousie University, sandra.toze@dal.ca

Dr. Colin Conrad, School of Information Management, Dalhousie University, colin.conrad@dal.ca

Introduction

I invite you to take part in a research study being conducted by Rachel Moylan, a graduate student in the Master of Information program at Dalhousie University, under the supervision of Dr. Sandra Toze and Dr. Colin Conrad. Choosing whether or not to take part in this research is entirely your choice. There will be no impact on your studies if you decide not to participate in the research.

The information below tells you about what is involved in the research, what you will be asked to do and about any benefit, risk, inconvenience or discomfort that you might experience.
You should discuss any questions you have about this study with Rachel Moylan. Please ask as many questions as you like. If you have questions later, please contact Rachel Moylan.

Purpose and Outline of the Research Study

You are invited to participate in this study because I want to understand how students feel about participating in group work, especially the process of generating new ideas as part of a group. This study will help me understand this by giving insight into your preferences, beliefs, and experiences working with others.

This interview is expected to take about 35-45 minutes to complete. You can ask questions at any time. I plan to recruit around 12 people for this study.

Who Can Take Part in the Research Study
In order to participate in this study, you must be a student who is taking at least one online course in in the Fall 2020 semester at Dalhousie University that includes at least one group assignment.

What You Will Be Asked to Do
If you decide to participate in this study, you will be asked to attend one interview session remotely using Microsoft Teams. The location of the interview is subject to university and provincial regulations as well as your preference. The interview will take about 35-45 minutes to complete. During the interview you will be asked to answer questions about your experiences working as part of a group in the Fall 2020 semester. Please answer the questions honestly and to the best of your ability. You may skip any question you do not wish to answer, and you may end the interview at any time.

The audio from your interview will be recorded using a digital recorder and transcribed. Original audio recordings will be permanently deleted after transcription. Direct quotes of things you say may be used without identifying you.

Possible Benefits, Risks and Discomforts
You may experience emotions as you describe your group work experiences. You may skip any questions without giving a reason, and you may end the interview at any time. You may benefit by reflecting on your group work experiences. Participating in the study and sharing your experiences with group work in the Fall term will in no way impact your academic standing or your relationship(s) with group members.

Microsoft Teams will be used for the interview, a separate digital recorder will be used to record only the audio from the interview. Microsoft Teams, Dalhousie's approved video conferencing tool, does not route data through servers outside of Canada, and encrypts all calls. After the interview, I will immediately transcribe the audio recording and then delete it.

How Your Information Will be Protected
Your name and email address are the only personally identifying information about you that will be collected as part of this study. This personally identifying information will be stored in a locked cabinet in the lead researcher's home, and will be destroyed as soon as data collection ends. There will be no way to link the final results of this study to you.

If You Decide to Stop Participating
You are free to leave the study at any time, without penalty. You can inform the researcher that you would like to stop, or simply leave the interview, and the interview will end. If you would like any or all of your answers to be removed from the study, you may inform the researcher any time before December 15th, 2020.

How to Obtain Results
Research findings will be made available online via DalSpace in the form of a research thesis. You may also request access to the final results by contacting Rachel Moylan at rachel.moylan@dal.ca

Questions
We are happy to talk with you about any questions or concerns you may have about your participation in this research study. Please contact Rachel Moylan (rachel.moylan@dal.ca) or Dr. Sandra Toze (sandra.toze@dal.ca) or Dr. Colin Conrad (colin.conrad@dal.ca) at any time with questions, comments or concerns about the research study.

If you have any ethical concerns about your participation in this research you may also contact Research Ethics, Dalhousie University at 902-494-1462, or email: ethics@dal.ca.

Signature Page: Remote Interview

Project Title: Creative group processes in a remote educational environment

Lead Researcher: Rachel Moylan, Master of Information Candidate, School of Information Management, Dalhousie University, rachel.moylan@dal.ca

Supervisors: Dr. Sandra Toze, School of Information Management, Dalhousie University, sandra.toze@dal.ca; Dr. Colin Conrad, School of Information Management, Dalhousie University, colin.conrad@dal.ca

The following questions will be read aloud to the participant. Reading of the statements and the participant's oral responses will be audio-recorded. If the participant answers "No" to any question, the study will not proceed. If the participant answers "Yes" to all questions, the study will commence.

> "Have you read the explanation about this study, and been given the opportunity to discuss it and have your questions answered to your satisfaction?"
>
> "Do you understand that you've been asked to take part in an interview that will occur at a location acceptable to you, and that the interview will be recorded?"
>
> "Do you understand that direct quotes of things you say may be used without identifying you?"

> "Do you agree to take part in this study, acknowledge that your participation is voluntary, and understand that you are free to withdraw from the study at any time, until December 15th, 2020?"

If the participant has answered "Yes" to all questions, they will be asked the following:

> "Would you like to be sent a summary of the study results? If so, could you please provide the email address to which you would like the results to be sent?"

Appendix E: Survey Questionnaire

Thank you for participating in the survey. The following questions concern demographics and your experiences and feelings about group work. Please answer the following questions as accurately and truthfully as possible.

1. *What is your age?* (Under 18; 18-24; 25-35; 35 or older)
2. *Which of the following best describes your gender?* (Woman; Man; Other; Prefer not to disclose)
3. *What is the main language that you use at home?* (input field)
4. *Are you an international student?* (yes/no)
5. *Which academic program are you currently enrolled in?* (input field)
6. *How is your academic program typically offered in non-COVID times?* (Face-to-face; Online)
7. *How many online courses are you taking this semester?* (1; 2; 3; 4; 5 or more)
8. *Prior to this semester, how many online courses have you taken?* (I have never taken an online course before; 1-2; 3-5; 6-10; 11 or more)

The following concern your experiences with group assignments in the past. Please answer as truthfully as possible.

9. *Have you participated in a group assignment for a FACE-TO-FACE class at the undergraduate or graduate level? A group assignment is any assignment for which you were required to work with at least one other person to produce an end product, such as a report or presentation.* (yes/no)
10. *If you have participated in a group assignment for a FACE-TO-FACE class, which tools have you used to conduct group work? Check all that apply.* (email; Microsoft OneDrive; Google Drive; Facebook; video conferencing tools, such as Microsoft Teams or Zoom; phone calls; text messages; other [input field]; Not applicable.)
11. *Have you participated in a group assignment for an ONLINE class at the undergraduate or graduate level?* (yes/no)
12. *If you have participated in a group assignment for an ONLINE class, which tools have you used to conduct group work? Check all that apply.* (email; Microsoft OneDrive; Google Drive; Facebook; video conferencing tools, such as Microsoft Teams or Zoom; phone calls; text messages; other [input field]; Not applicable.)

The following questions concern your preferences about group assignments and working with others. Please answer as truthfully as possible (1, strongly disagree; 7, strongly agree).

13. *I would rather complete an individual assignment than a group assignment.*
14. *I would rather work with people I know than people I have just met.*
15. *I would rather try to come up with new ideas in collaboration with others than on my own.*

The following questions concern your beliefs about group assignments and working with others. Please answer as truthfully as possible (1, strongly disagree; 7, strongly agree).

16. *I have the necessary skills to work well as part of a group.*
17. *Group assignments are more difficult than individual assignments.*
18. *Some people are just lazy and will let others do all the work if they can get away with it.*
19. *Participating in group assignments can help students develop useful skills for the future.*
20. *It is important to do everything you can to avoid conflict when working with others.*
21. *It is more effective for groups to work together in person than remotely.*
22. *Students working together at my level of study are mature enough to complete group assignments without discussing roles and expectations.*

The following questions concern your beliefs about idea generation and group assignments. Please answer as truthfully as possible (1, strongly disagree; 7, strongly agree).

23. *I often suggest new ways to achieve goals or objectives.*
24. *I often come up with new and practical ideas to improve performance.*
25. *I exhibit creativity in my work when given the opportunity to.*
26. *I come up with creative solutions to problems.*
27. *My contributions to group work are creative.*
28. *My contributions to group work are original.*
29. *Do you have any additional comments about group assignments that you would like to share?* (input field)

Appendix F: Semi-Structured Interview Script

Note: Some questions have been adopted from Dr. Sandra Toze's PhD dissertation research instruments.

1. Could you tell me about yourself, your background, and why you chose to enroll in a program at Dalhousie University?
2. Could you tell me a bit about your current program?
3. Could you tell me about the course and group assignment you've participated in this semester?
    a. *(Will only be asked if participant has not provided enough information for researcher to fully understand the assignment)* Could you tell me more about the assignment guidelines?
4. Could you tell me more about how your group was formed? Were you assigned to work together or did you have choice in selecting group members? (RQ3)
5. Did your course instructor provide instruction or guidelines to help you establish group rules, or help your group collaborate in any way? If so, can you tell me about that? (RQ3)
6. How well did you know your group members before beginning this assignment? (RQ3)
7. How well do you know your group members now? (RQ3)
8. Can you tell me more about the other members of your group? How similar would you consider them to be to yourself? (RQ3)
9. Can you tell me about how your group came up with ideas in the beginning stages of this assignment? Did you each spend time on your own thinking of ideas, did you brainstorm together, or something else? (RQ2)

10. What about later as you worked on the assignment? (RQ2)
11. Do you think your group was successful in coming up with good ideas? (RQ3)
12. Did everyone in your group share ideas? (RQ2)
13. How did your group decide which ideas to use? (RQ2)
    a. *(Will only be asked if participant has not provided enough information for researcher to fully understand their answer to question 13)* How difficult was it for your group to decide which ideas to use?
14. Did you share any ideas that were not accepted by the group? (RQ2)
15. Did any of your group members share ideas that were not accepted by the group? (RQ2)
16. Did you have any disagreements or conflicts within your group? If so, can you tell me more about what happened? (RQ2)
17. What technologies did the group use? Did they help you? (RQ2)
18. Do you feel that your group was successful? (RQ3)
19. Do you think your group worked well together? (RQ3)
20. Do you feel the other members of your group valued your contributions? (RQ3)
21. How did this group experience compare to working with other groups? (RQ3)
22. Is there anything else you'd like to share?

Appendix G: Coding Scheme

1. Cognitive Presence
    1.1. Triggering event
        1.1.1. Identifying the problem
            1.1.1.1. Presence
            1.1.1.2. Absence
        1.1.2. Wondering/Puzzling
            1.1.2.1. Presence
            1.1.2.2. Absence
        1.1.3. Planning the approach
            1.1.3.1. Presence
            1.1.3.2. Absence
    1.2. Exploration
        1.2.1. Generating ideas
            1.2.1.1. Independently
            1.2.1.2. Nominal group
            1.2.1.3. Brainstorming group
            1.2.1.4. Absence
        1.2.2. Seeking information
            1.2.2.1. Independently
            1.2.2.2. Collaboratively
            1.2.2.3. Presence
            1.2.2.4. Absence
        1.2.3. Sharing information
            1.2.3.1. Presence
            1.2.3.2. Absence
        1.2.4. Discussing ambiguities
            1.2.4.1. Presence
            1.2.4.2. Absence
    1.3. Integration
        1.3.1. Connecting ideas
            1.3.1.1. Presence
            1.3.1.2. Absence
        1.3.2. Making decisions
            1.3.2.1. Unilaterally
            1.3.2.2. Collaboratively
            1.3.2.3. Majority
        1.3.3. Resolving conflicting understandings
            1.3.3.1. Presence
            1.3.3.2. Absence
        1.3.4. Creating solutions
            1.3.4.1. Presence

1.3.4.2. Absence

2. Social Presence
   2.1. Identifying with the group
      2.1.1. Identifying shared social identity (i.e., purpose of the assignment)
         2.1.1.1. Presence
         2.1.1.2. Absence
      2.1.2. Identifying shared ground rules (e.g., expectations for communication)
         2.1.2.1. Presence
         2.1.2.2. Absence
   2.2. Communicating
      2.2.1. Expressing opinions
         2.2.1.1. Presence
         2.2.1.2. Absence
      2.2.2. Acknowledging opinions of others
         2.2.2.1. Presence
         2.2.2.2. Absence
      2.2.3. Opinions acknowledged by others
         2.2.3.1. Presence
         2.2.3.2. Absence
      2.2.4. Using nonverbal cues
         2.2.4.1. Presence
         2.2.4.2. Absence
      2.2.5. Social conflict
         2.2.5.1. Preventing social conflict
         2.2.5.2. Avoiding addressing social conflict
         2.2.5.3. Addressing social conflict
      2.2.6. Communicating with a subgroup
         2.2.6.1. Presence
   2.3. Developing interpersonal relationships
      2.3.1. Encouraging collaboration
         2.3.1.1. Presence
         2.3.1.2. Absence
      2.3.2. Supporting others
         2.3.2.1. Presence
         2.3.2.2. Absence
      2.3.3. Supported by others
         2.3.3.1. Presence
         2.3.3.2. Absence
      2.3.4. Feeling of knowing others
         2.3.4.1. Presence
         2.3.4.2. Absence
      2.3.5. Sharing personal information
         2.3.5.1. Presence

2.3.5.2. Absence

3. Teaching Presence
   3.1. Design
      3.1.1. Structuring course
         3.1.1.1. Highly structured
         3.1.1.2. Flexible structure
         3.1.1.3. Minimal structure
         3.1.1.4. Presence
         3.1.1.5. Absence
      3.1.2. Structuring assignment
         3.1.2.1. Highly structured
         3.1.2.2. Flexible structure
         3.1.2.3. Minimal structure
      3.1.3. Structuring group work
         3.1.3.1. Highly structured
         3.1.3.2. Flexible structure
         3.1.3.3. Minimal structure
   3.2. Facilitation
      3.2.1. Engaging in discussions
         3.2.1.1. Presence
         3.2.1.2. Absence
      3.2.2. Providing timely assignment feedback
         3.2.2.1. Presence
         3.2.2.2. Absence
      3.2.3. Communicating clear expectations
         3.2.3.1. Presence
         3.2.3.2. Absence
      3.2.4. Responding to student communication
         3.2.4.1. Presence
         3.2.4.2. Absence
      3.2.5. Facilitating group work
         3.2.5.1. Presence
         3.2.5.2. Absence
4. Agency
   4.1. Direct personal agency
      4.1.1. Choosing assignment topic/content before group formation
         4.1.1.1. Presence
         4.1.1.2. Absence
      4.1.2. Choosing group members
         4.1.2.1. Presence
         4.1.2.2. Absence
      4.1.3. Demonstrating personal interest/investment in assignment
         4.1.3.1. Presence

4.1.3.2. Absence
4.1.4. Advocating for self
4.1.4.1. Presence
4.1.4.2. Absence
4.1.5. Influencing other individual(s) in the group
4.1.5.1. Presence
4.1.5.2. Absence
4.1.6. Influencing direction of the group
4.1.6.1. Presence
4.1.6.2. Absence
4.2. Proxy agency
4.2.1. Trusting others to assist in meeting an objective
4.2.1.1. Presence
4.2.1.2. Absence
4.3. Collective agency
4.3.1. Choosing assignment topic/content as a group
4.3.1.1. Presence
4.3.1.2. Absence
4.3.2. Choosing deliverable(s)
4.3.2.1. Presence
4.3.2.2. Absence
4.3.3. Choosing procedures for group's work
4.3.3.1. Presence
4.3.3.2. Absence
4.3.4. Choosing to divide work based on individual strengths
4.3.4.1. Presence
4.3.4.2. Absence
4.3.5. Advocating as a group
4.3.5.1. Presence
4.3.5.2. Absence
4.3.6. Moderators
4.3.6.1. Free riding
4.3.6.2. Idea fixation
4.3.6.3. Shared leadership
4.3.6.4. Not shared leadership
4.3.6.5. Individualistic mindset
4.3.6.6. Collectivistic mindset

5. Online Environment
5.1. Tools used
5.1.1. University-provided technology (e.g., MS Teams)
5.1.2. Other professional technology (e.g., Google Drive, Zoom)
5.1.3. Social media and/or mobile phone technology (e.g., Instagram, iMessage)
5.1.4. Internet search

- 5.1.5. Library search
- 5.1.6. Email

5.2. Moderators

- 5.2.1. Geographic distance
  - 5.2.1.1. Barrier
  - 5.2.1.2. Not a barrier
- 5.2.2. Time zones
  - 5.2.2.1. Barrier
  - 5.2.2.2. Not a barrier
- 5.2.3. Lack of nonverbal cues
  - 5.2.3.1. Barrier
  - 5.2.3.2. Not a barrier
  - 5.2.3.3. Support
- 5.2.4. Tools/Technology
  - 5.2.4.1. Barrier
  - 5.2.4.2. Not a barrier
  - 5.2.4.3. Support
- 5.2.5. Online communication
  - 5.2.5.1. Barrier
  - 5.2.5.2. Not a barrier
  - 5.2.5.3. Support
- 5.2.6. Lack of social time (with group)
  - 5.2.6.1. Barrier
  - 5.2.6.2. Not a barrier
- 5.2.7. Lack of independent processing time
  - 5.2.7.1. Barrier
  - 5.2.7.2. Not a barrier
- 5.2.8. Ghosting/Ignoring
  - 5.2.8.1. Barrier
- 5.2.9. Lack of accountability
  - 5.2.9.1. Barrier
  - 5.2.9.2. Not a barrier

6. Definitions of Success
   - 6.1. Generation of novel and useful ideas
   - 6.2. Grades
   - 6.3. Effective distribution of work
   - 6.4. Group cohesion
   - 6.5. Group effort
   - 6.6. Work output
     - 6.6.1. Quality
     - 6.6.2. Quantity
   - 6.7. Efficiency
   - 6.8. Comparison to rest of class

6.9. Completing assignment
6.10. Open-minded communication
6.11. Professionalism
6.12. Submitting work on time
6.13. Trust/approval from instructor
6.14. Networking/Building lasting relationships with group members

7. Demographics
   7.1. Age
      7.1.1. 18-24 years old
      7.1.2. 25-35 years old
   7.2. Gender identity
      7.2.1. Female
      7.2.2. Male
      7.2.3. Other gender identity
   7.3. Citizenship/Residency Status
      7.3.1. Canadian Citizen/Permanent Resident
      7.3.2. International
   7.4. Level of study
      7.4.1. Undergraduate
      7.4.2. Graduate
   7.5. Academic program
      7.5.1. Bachelor of Commerce
      7.5.2. Bachelor of Management
      7.5.3. Master of Business Administration
      7.5.4. Master of Information
   7.6. Typical program delivery (pre-COVID)
      7.6.1. Face-to-face
      7.6.2. Online
   7.7. Work experience
      7.7.1. No professional work experience
      7.7.2. Co-op work experience
      7.7.3. Full-time professional work experience (at least one year)

Appendix H: Total Response – Likert-Scale Survey Questions

Survey Question	**1** (Strongly disagree)	**2**	**3**	**4**	**5**	**6**	**7** (Strongly agree)
Q13. I would rather complete an individual assignment than a group assignment.	12	26	26	49	71	68	122
Q14. I would rather work with people I know than people I have just met.	11	16	33	64	46	62	142
Q15. I would rather try to come up with new ideas in collaboration with others than on my own.	28	33	54	98	76	49	36
Q16. I have the necessary skills to work well as part of a group.	3	5	7	25	62	131	141
Q17. Group assignments are more difficult than individual assignments.	11	28	34	68	77	61	95
Q18. Some people are just lazy and will let others do all the work if they can get away with it.	5	12	21	24	68	84	160
Q19. Participating in group assignments can help students develop useful skills for the future.	8	11	26	42	79	76	132
Q20. It is important to do everything you can to avoid conflict when working with others.	5	13	47	64	80	77	88

Survey Question	**1** (Strongly disagree)	**2**	**3**	**4**	**5**	**6**	**7** (Strongly agree)
Q21. It is more effective for groups to work together in person than remotely.	8	28	20	46	58	67	147
Q22. Students working together at my level of study are mature enough to complete group assignments without discussing roles and expectations.	43	51	67	60	76	40	37
Q23. I often suggest new ways to achieve goals or objectives.	2	9	14	66	118	99	66
Q24. I often come up with new and practical ideas to improve performance.	1	7	20	58	128	95	65
Q25. I exhibit creativity in my work when given the opportunity to.	4	5	16	46	121	90	92
Q26. I come up with creative solutions to problems.	4	4	22	57	107	122	68
Q27. My contributions to group work are creative.	4	5	16	64	117	100	68
Q28. My contributions to group work are original.	2	4	13	59	107	85	104

Appendix I: Recommendations for Instructors

The design and facilitation of group assignments intended to foster communication, collaboration, and creativity requires thoughtful planning and purposeful implementation. The list below, based on extant research and findings from this thesis, outlines key recommendations for instructors interested in using group assignments as part of a cooperative learning experience in an online environment. Many of these recommendations also apply to the design and facilitation of such group assignments in face-to-face courses. Most recommendations are applicable for both undergraduate and graduate courses. Recommendations specific to undergraduate or graduate students have also been noted in some instances.

Design

Articulate the Purpose
Articulate the content and skills intended to be developed through the completion of the assignment. Articulate the rationale for completing the assignment in a group rather than individually. Explain steps taken to ensure the assignment is designed to teach the relevant content and skills.

Incorporate Opportunities for Choice
Allow for choice in one or more aspects of the group assignment, such as choosing group members, choosing assignment topic, and/or choosing assignment deliverable(s). If allowing students to choose group members, provide support for students who may not know others in the class and may need help connecting with others, such as a discussion board forum or the option to privately submit a form requesting assistance.

Require a Team Charter
Design a team charter assignment that asks students to discuss and determine task-related processes, such as processes for seeking information, sharing information, and generating ideas, in addition to procedural and interpersonal processes. Include the opportunity for students to share their strengths and weaknesses, as this will assist in effective distribution of work over the course of the assignment. Incorporate structures that encourage shared leadership rather than asking one student to serve as team leader. Build in checkpoints for students to revisit and re-evaluate their decisions over the course of the group assignment with instructor support.

Encourage Synchronous Video Meetings
Explain the benefits of communicating using synchronous video meetings and the potential drawbacks of relying solely on text-based communications. Choose one platform for all students in the course to use, and develop guidelines for using the features available within this platform.

Set Clear, Flexible Expectations
Set clear expectations for students through assignment guidelines and rubrics but build in flexibility. Consider implementing developmental and holistic rubrics rather than analytic rubrics.

Create Flexible Structures
Design structures for mediated interactions to encourage students to voice divergent ideas. Create a centralized system of informing group members of the contributions of others, such as a shared table mediated by a TA, project coach, or instructor. Create structures for students to communicate quickly and easily with instructional staff.

Facilitation

Teach Interpersonal Skills
Teach and model interpersonl skills, such as reflective listening, through course activities and interactions with students.

> **Undergraduate:** Emphasize the importance of encouraging appropriate group social behaviours and avoiding problematic behaviours, such as free riding or production blocking. Provide practical steps to take in the event a group member is exhibiting inappropriate group social behaviours.
> **Graduate:** As graduate students seem to value group dynamics over external factors, incorporate activities early in the semester to encourage the development of group cohesion.

Teach and Encouarge Specific Technological Tools
Teach students how to use key features of Microsoft 365 products, such as Track Changes and Comments in Microsoft Word.

> **Undergraduate:** Teach students about the benefits of using video during meetings to build interpersonal relationships. Encourage students to keep their video turned on if possible.
> **Graduate:** Encourage the use of tools that allow for efficiency, such as the Planner application in Microsoft Teams.

Monitor and Support Group Work
Implement processes for checking in and assisting groups throughout their work. Ensure students are aware they are not being assessed or graded during these check-ins.

Teach Nominal Group Technique
Instruct students in best practices for idea generation by guiding them through the nominal group technique. Explain structures in place and how they assist with the generation of novel and useful ideas.

Provide Timely Guidance
Respond promptly to requests for clarification or assistance. Check in with students throughout their group work experiences.

Elicit Student Feedback

Request informal, private (i.e., through individual channels rather than whole-class discussion boards) feedback from students concerning the course and group assignment(s). Discuss student feedback constructively with student groups and/or the class.

Provide Timely, Clear Assignment Feedback

Communicate assignment grades and feedback to students in a timely manner. Allow opportunities for discussion of feedback regarding areas of strength and challenge.

> **Undergraduate:** As undergraduate students seem to be especially dependent upon grades in evaluating group success, consider including and grading a formative group assessment early in the process to allow students to develop a baseline understanding of their success and incorporate instructor feedback in later stages of the assignment.