

FUTURE RESEARCH IN IMPROVING GROUP PERFORMANCE: AWARENESS OF NATIONAL CULTURE AND TECHNOLOGY

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ABSTRACT

We have presented two streams of research at several IABD conferences: one stream described the relationship between technology and group performance; a second explored cultural differences and impact on interpersonal relations. We gathered data from two focus groups and surveys of American and Chinese university students, testing whether Millennials across two different cultures would use technology in similar fashion to complete classroom assignments. We also collected the perspectives and interpretations regarding cultures of China, the United States and Western Europe from a group of leaders of privately owned businesses in China. Data suggest that several intervening variables need to be considered and that culture has a direct impact on students' use of and preference for technology. Generalized trust has a direct impact on the choice of technology. In addition, national culture directly affects generalized trust. Our original perception included the expectation that group processes were essential in resulting in higher group performance. Results indicate, for example, interpersonal trust, a more specific concept than generalized trust, has a major impact on the performance of any group, and peer learning is both a mediating variable and a desirable outcome for faculty and students. So, this level of interpersonal trust is impacted by the type/level of technology and it also mediates the relationship between technology and group performance. We present this extended version of our research model and discuss the implications it suggests for further research, including asking questions to help us learn more about the impact of COVID-19 and Black Lives Matter, and the unprecedented situation in which we find ourselves today.

Keywords: National culture, Generalized trust, Communication types, Intragroup processes, Impact of COVID-19 and Black Lives Matter

INTRODUCTION

For the past few years, two parallel streams of research have modified our initial research model into a much more complex and more realistic view of how to increase student performance in college coursework. One stream involves the role of technology in students' experiences while completing course team assignments. The second stream of interest concerns the impact of culture/diversity on affecting group performance and interactions. Team projects are assigned more frequently, and teamwork is considered a highly desirable outcome. Our initial research question was based upon an independent variable of level/type of technology and dependent variable of performance, namely: "How do students use face-to-face (FTF) and computer-mediated communication (CMC) throughout the process of completing group projects as course assignments?" (Choi, Zeff, & Higby, 2017) (See Figure 1, below.) Results from two focus groups

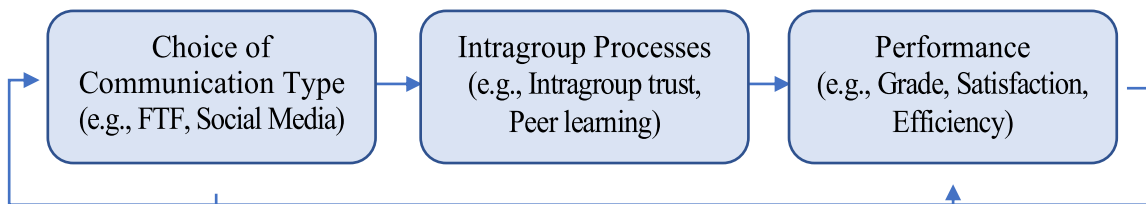
led to the development of a questionnaire, to which we gathered responses from a Midwestern American university (Choi, Zeff, & Higby, 2018).

Figure 1. Initial Research Model



Focus group results and survey data collected from samples of American and Chinese university students provide information that informs several major variables helpful in explaining how group performance can be improved during classes using team projects as course assignments. We found several factors that modify and expand our research model, adding sophistication and complexity, and better describing the relationship between communication type and group performance. We now highlight particular intervening variables within this extended model, including intragroup trust and peer learning, and recognize the need to collect specific data regarding these (and other) constructs. See Figure 2, below.

Figure 2. Extended Research Model (Horizontal Elements)

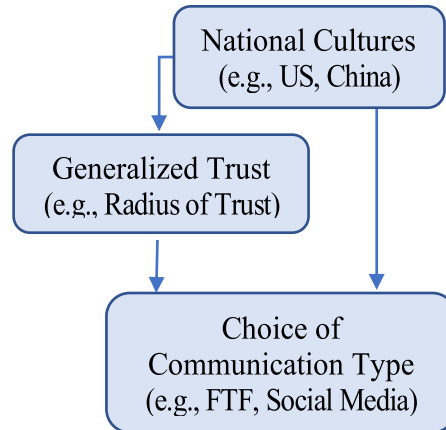


The second stream of interest came into play when a Global Leadership Conference involving Chinese business leaders in the automobile industry brought the importance of culture into focus for us (Zeff, & Higby, 2017). These business leaders were from private companies in China who were very sensitive to cultural differences between leaders from different countries and, as we found in this conference, between Chinese leaders in the private and public sectors. We also learned that culture has an impact on the concept of generalized trust (Delhey, Newton, & Welzel, 2011; Lewis, 2006; Zeff, & Higby, 2017). Our research model was becoming more complicated since the trust factor also modified the relationship between technology and performance. This stream of research played a major role in the enlargement and development of our research model, especially after data revealed differences between respondents from the US and China. The role of culture was identified as being central in affecting the impact on students' preferences for and uses of level/type of technology (Choi, Zeff, & Higby, 2019; see also, Šerić, 2020). See Figure 3, below.

These Chinese business people were very clear that national culture provides a contextual framework for all of the elements found in our representation of our first stream of research (Zeff & Higby, 2017), as depicted in Figure 2, above. There are three sources of internal cultural clashes within China that have been identified both in the literature and by these Chinese business leaders. These clashes are consistent with the variable denominators of Tung, Worm, and Fang (2008), and include: the clashing cultures in China between younger and older generations, particularly

between Millennials/Gen Xers and Baby Boomers (see, for example, Vieregge & Quick, 2011); the clashing cultures between Chinese state-owned enterprises and the privatized companies (represented by the participants in the Leadership Conference) (see, e.g., Lardy, 2014); and, the clashing cultures between geographic/economically developed areas within China itself (see, for example, Kwon, 2012).

Figure 3. Cultural Impact (Vertical Elements)



We were also fortunate at this time to have a visiting scholar from China at our University to provide insight into the educational process in China and to translate our questionnaire into Chinese for data gathering at a Chinese university. Did students in China use technology in the completion of group projects the same way as students in the U.S.? After better understanding the role of culture in this relationship between type of interaction and performance in group projects, we began to enhance our research model. It is this enhanced model that we present for better understanding of this relationship and as a research model for future testing.

The situations we have all experienced in responding to COVID-19 places a spotlight on this and many similar areas of investigation as we move into a new “normal,” whatever that turns out to be. Figure 2 focuses on the impact of type of communication on performance, particularly how technology might affect individual and group effectiveness. For example, many universities are already gathering data on the impact and effectiveness of online coursework that replaced offline education for the last two months of the academic year just ended. This is a straightforward example of comparing FTF and virtual interaction as they impact student effectiveness in course completion. In our Midwestern university, preliminary research findings suggest that 34% of faculty and 28% of students agree or strongly agree with the statement “I believe that online teaching/learning/communication can be as effective as traditional teaching,” while 24% of faculty and 37% of students disagree or strongly disagree (Zhong & Slowik, 2020). Note that this statement does not ask for how effective respondents think online education was, versus offline education for the first half of the semester. Instead, it asks how effective online education “can” be, as a possibility or ideal. So, there is no direct correspondence with our survey and this result cannot be compared to our results. We will discuss this in relation to data coming out of other university findings later in this paper to gain a more complete picture of where future research might be more illuminating for this whole topic area. These results seem to be optimistic and appear to be in contradiction with findings from our studies that strongly indicate how FTF

communication is both preferred and viewed as more effective by all of our respondents, including undergraduate students, graduate students, males, females, US students and Chinese students. Learning the impact of different communication types on our students and on our faculty is essential in helping us become better instructors and helping our students get more out of their educational and interpersonal interactions. The differences noted here seem to indicate the importance of gathering more information in future research for better decision-making in these areas.

PREVIOUS STUDIES

To help define our first stream of research, we summarize three studies previously published in Quarterly Review of Business Disciplines. The focus for the first study was how students use both face-to-face (FTF) and computer-mediated communication (CMC) to complete group projects for class. Specifically, our research question was: How do students use FTF and CMC throughout the process of completing group projects as course assignments? We conducted two focus group interviews to answer this question. They had nine and seven participants, respectively, and all of the interview participants (n=16) were undergraduate students at a mid-sized private, mainly commuter university in an urban center of the Midwest United States. Each focus group interview was conducted in a one-hour FTF meeting. We applied a qualitative research methodology and analyzed our data using QSR International's (2012) NVivo qualitative data analysis software (Version 11).

Based on our experiences and literature review, we created a patterned interview form comprised of three basic questions: what role does technology play in how you interact with members of your group; what are your experiences with FTF and CMC meetings (what impact did each play in developing trust and creating satisfaction, and what types of interactions, project or non-project related, did you have); and, how would you describe a really good group, a really good experience, and then compare that to a not so good group to help us understand the differences. We expanded upon each question based on participants' responses.

We found that students: are more satisfied with FTF interactions; believe that they perform better in FTF situations; prefer FTF meetings; use technology for efficient and task-oriented activities; and, generally use more FTF at the beginning and end of a group project with an increased usage of CMC in the middle, after trust is developed.

Using results from this exploratory study, a 66-item questionnaire was developed (Choi et al., 2018) to gather more explicit information and begin to determine what American student experiences suggest regarding their use and impact on group project performance. Our research question was: do students' experiences with and preferences for increased/enhanced technology in the completion of group assignments support and encourage an increased emphasis on technology-based interaction by faculty? This survey, used by permission, was translated and pre-tested by a Chinese scholar so a comparative sample could be collected from students at a university in China. After data collection, the survey was back translated by an independent interpreter to ensure the quality and accuracy of the results. This Chinese scholar was both very open and helpful in her contributions and discussions about Chinese students. However, she chose not to be included as a contributing author of this study.

U.S. student data were collected during the 2016-17 academic year at an urban Midwestern United States university. All 82 students were taking courses in a college of business administration. Demographic information indicates 80.5% (66) of these students were born between 1990 and 2000, with the remaining 16 students being born between 1980 and 1989. Furthermore, 58.5% (48) are female and 60.9% (50) are graduate students. All but one student (98.8%) has access to and uses a smartphone, while every respondent indicates he/she has access to and uses a computer.

Our Chinese sample comprised students attending a state-run university in a large, industrial city in southeastern China who filled out the same questionnaire in the summer, 2017. Usable surveys include 145 mainly undergraduate responses (7.6% [11] were graduate student responses). Three students (2.1%) were born between 1980 and 1989 while 97.9% (142) of all students in this sample were born between 1990 and 2000. Females comprise 65.5% (95) of the sample. Responses indicate 96.6% (140) have and use smartphones and 49.0% (71) have access to and use computers.

Comparing results from these two samples indicate more effective project performance for both samples occur with FTF interaction than any form of technology-based communication. Both samples also agree that FTF is the most preferred form of interaction and virtual meetings are the least preferred. FTF interactions lead to higher performance than do virtual interactions, and outcome, grades, satisfaction, experience and efficiency are all higher. FTF communication is also more effective than social media in dividing up project work and encouraging the exchange of ideas.

U.S. students experience an even more positive view of FTF communication, while Chinese students rely more heavily on social media. The major role of social media for Chinese respondents is to gather additional personal information to expand the radius of trust. Since this expanded radius increases the comfort level, it allows for enhanced group and individual performance. The role of trust is the same in both American and Chinese cultures, although the Chinese need greater personal interaction to gain the requisite level of trust for high performance.

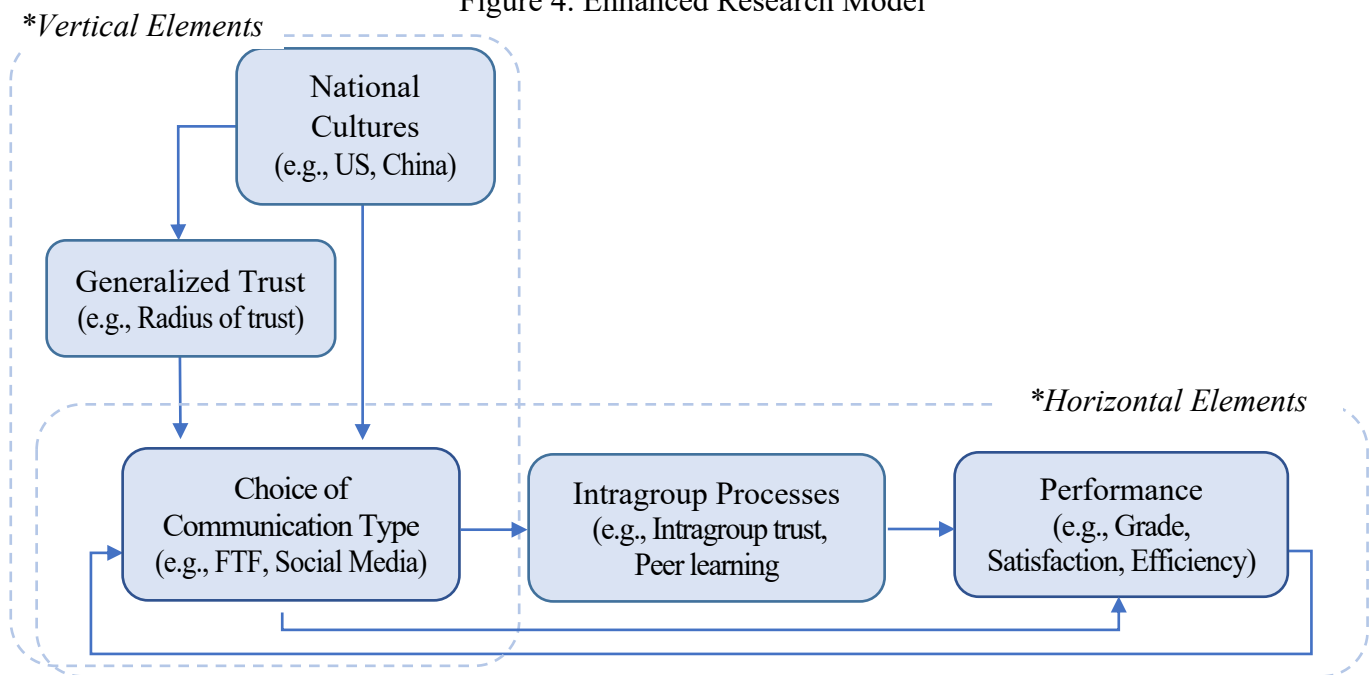
Our second stream of research began to flow as a result of a Global Leadership Conference, in Detroit in October 2015 highlighting cultural differences between the United States and China. Twenty owners and top-level executives of privately held companies in the automotive industry in China were travelling to several of their major customers in the Middle East, Western Europe and the United States to learn more about cultural differences. They provided frank discussions and responded to an open-ended questionnaire regarding cultural impact and characteristics in China at both state-owned and private institutions. The attendees recognized a need to improve, enhance and speed up the process of innovation within their own companies and the Chinese economy as a whole. They understood the important role played by culture within both Chinese companies and, increasingly, with companies throughout the global economic community with whom they did business. In China, the culture within which the private company leaders operated is very consistent with the national culture of the United States, as defined by the Hofstede paradigm (Hofstede, Hofstede, & Minkov, 2010). The culture within which leaders of state-owned companies operate is very consistent with the traditional Chinese national culture (Hofstede et al., 2010). And these automobile executives attribute the dramatic differences in results of both types of organizations directly to this one variable. Private companies in China have a critical edge over their state-owned counterparts; private companies earn higher returns – 14% on average versus 4% earned by state-owned companies (see, e.g., Liu & Sui as cited in Hout & Michael, 2014).

Participants in this seminar were leaders of private businesses existing within the context of Chinese state-owned businesses and were very much aware that at present the major innovations came from outside China, mainly from Europe and the United States. Their goal was to determine “best practices” from these areas and import them into China today, including culture and its impact on economic success, while learning about these other cultures to be better prepared to hasten the innovation process tomorrow. These business leaders identified culture as a primary element in determining company and country success. This emphasis, along with information derived from student survey results, provided the support and input into additional modifications for our expansion and full development of our research model.

MODEL DEVELOPMENT

Our enhanced research model, built initially on previous research and accounting for all the modifications made resulting from multiple sets of data collected (including two focus groups, questionnaire data from American students and the comparable data from Chinese students) and data collected from Chinese business leaders, is presented below in Figure 4.

Figure 4. Enhanced Research Model



We were able to include the first stream of interest, the impact of choice of technology on group performance, as an independent-dependent relationship. This is seen in the bottom part of our model as a set of horizontal elements. Our initial emphasis was on trying to understand this relationship, and data collected from the two focus groups added some intervening variables by filling out the Intragroup Processes section of this relationship.

FTF interactions provide more complete communication since both verbal and non-verbal cues are part of the social exchange process (Short, Williams, & Christie, 1976). Digital communication can limit direct personal observations that allow members to perform effective cognitive trust assessment (Robert, Denis, & Hung, 2009). Awareness of who is responsible for specific outcomes

(Cui, Lockee, & Meng, 2013) and issues of accountability (Driskell, Radtke, & Salas, 2003; Reio & Crim, 2006) further reduce overall performance, while increasing frustration and dissatisfaction, and lowering participation. It has been found when social context cues are missing, increased depersonalization, lower cohesiveness, and less social conformity often result (Lu, Fan, & Zhou, 2016; Szeto & Cheng, 2013). Much of the literature concludes that FTF interaction at the beginning of a group project enhances the level of trust. Hambley, O'Neill, and Kline (2007), Horwitz and Horwitz (2007) and Lantz (2001), for example, advise project teams to have at least an initial FTF meeting before following up with virtual team interactions. Kennedy, Vozdolska, and McComb (2010) found in their behavioral simulation study that mixed-media teams (i.e., first as FTF and second as digital communication) had improved participative decision making over only digital communication teams. Both high and low media richness levels are effective when matched with appropriate tasks. For example, media with lower richness are effective when used with more routine tasks and richer media are better matched with nonroutine, complex and ambiguous tasks (Denstadli, Julsrud, & Hjorthol, 2012).

The second stream, the inclusion of culture and generalized trust into our area of investigation, really creates a new independent/dependent relationship into this model: vertical elements are added on top of Choice of Communication Type where National Culture becomes a new independent variable, Generalized Trust becomes a new intervening variable, and Choice of Communication Type, the independent variable in our original research model, becomes a new dependent variable. Our extended model is more complex. However, we believe this complexity is necessary in providing a more realistic view of the relationships among these variables. These two streams of research, and their research models, work well together in better describing our initial concerns regarding the use and impact of technology within classroom group projects, especially in comparative analyses. Our descriptions and explanations are more complete, accurate and realistic as a result. We now describe some more details about each of these variables as they appear in our model.

Performance

According to the input-process-output (IPO) model (McGrath, 1964) which has served as a valuable guide for researchers over the years, inputs describe antecedent factors that enable and constrain members' interactions. Outputs are results and by-products of team activity that are valued by one or more constituencies (Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000). Broadly speaking, these may include performance (e.g., quality and quantity) and members' affective reactions (e.g., satisfaction, commitment and viability). Performance is the most widely studied criterion variable because teams exist to perform tasks (Argote & McGrath, 1993; Bommer, Johnson, Rich, Podsakoff, & MacKenzie, 1995). Also, it is necessary in a review of team outcomes to include members' affective reactions, such as team viability which is often considered in terms of the extent to which individuals wish to remain as members of the team (Mathieu, Maynard, Rapp, & Gilson, 2008).

Initially, our view of performance when we first started this research stream suggested the only outcome of concern to students, and perhaps faculty as well, was the grade received for a group project. The first focus group, a group of highly motivated senior honor students, surprised us by indicating that satisfaction with their group members was very important, so important that they

would decide whether to work again with a particular student based on their satisfaction level rather than what grade they received on a group project (Choi et al., 2017). This focus group also surprised us when they stressed that FTF interactions were much more efficient at the beginning of projects than were any form of technological interactions. We were particularly surprised when graduate students responded on the questionnaire, students we believed were especially pressed for time, that FTF meetings were more efficient and, as a result, more preferable than either virtual or social media interaction (Choi et al., 2018). We could reconcile these differences from our initial expectations only when we considered the complexity of the tasks to be performed in the group with the research findings by Denstadli et al. (2012). “Performance,” therefore, was really comprised of at least three elements: grade; satisfaction; and, efficiency.

Intragroup processes

Team processes have played a central role in most team effectiveness models (Gist, Locke, & Taylor, 1987; Guzzo, & Shea, 1992; Hackman, 1983). Processes are important because they describe how team inputs are transformed into outputs. Various processes combine to drive team performance, which intervenes between the role of communication types and the ultimate impact on task accomplishment. Our model includes the major intervening variables that became apparent in our data collection during our three previous studies. The two most obvious from our data are intragroup trust and peer learning, and these are discussed below.

We focused on group projects since faculty increasingly use them in coursework for several reasons: group situations occur more frequently in on-job environments; they provide many opportunities for allowing students to practice interacting with more diverse people to be better prepared for life beyond the university setting; to offer opportunities to gain feedback from others on how well they perform and interact with other people; students learn how to deal with difficult people and situations before they first encounter them on the job; and, peer learning is an effective and desirable method for enhancing student satisfaction and the educational process (Keppell, Suddaby, & Hard, 2011; Coates, Kelly, & Naylor, 2017). These insights provide several additions to our views of intragroup processes and enrich the information included in and sought by our research model. Small group activities and assignments are used to break down the size of the class and more closely replicate a work environment many students already face, and others will soon be entering. Group experiences provide opportunities for students to practice interpersonal and leadership skills, both of which transfer directly to the job (Lavy, 2017). They also increase participation and student involvement, which have direct relationships to the learning process (Frykedal, & Chiriac, 2018). Moreover, group projects allow students to try out new ideas on and to gain feedback from peers to improve contributions to project outcomes. In addition, students often experience accountability and group issues such as social loafing (Synnott, 2016). Students often return after they graduate and indicate how they face these same social loafing frustrations on the job, and they talk about how they feel better prepared to deal with them after facing these circumstances in group projects during their studies in college.

Intragroup trust. Scholars usually distinguish between two forms of trust in others (Freitag & Traunmüller 2009; Glanville & Paxton 2007; Sztompka, 1999; Welch, Rivera, Conway, Yonkoski, Lupton, & Giancola, 2005): one involves a narrow circle of familiar others and is called particular or specific trust; the other concerns a wider circle of less familiar others and is called general or

diffuse trust. In short, intragroup trust is particularized trust, which corresponds to trust between team members, while generalized trust refers to trust in other members of society (Carl, & Billari, 2014). In a newly formed team, which involves initial interaction with new members, generalized trust is more important than particular trust (Crisp & Jarvenpaa, 2013; Delhey et al., 2011; Hakonen, & Lipponen, 2009).

This level of trust is a specialized application of the concept of “Generalized Trust” (see Figure 4, above). Trust is a well-researched team process that leads to superior team performance (Crowe, Collins, Larue, Green, Hough, & Juvina, 2017). It is defined as “the willingness of a party [trustor] to be vulnerable to the actions of another party [trustee] based on the expectation that they will perform a particular action important to the trustor, irrespective of the ability to monitor or control the other party.” (Mayer, Davis, & Schoorman, 1995, p.712). In order for team performance to be improved, team members must be able to trust other members. For team members to trust in the team, they must feel that (a) the team is competent enough to accomplish their task (i.e., team confidence), and (b) that the team will not harm the individual or his or her interests (i.e., safety). Team confidence is defined as “a shared belief in a group’s collective capability to organize and execute courses of action required to produce given levels of goal attainments.” (Kozlowski, & Ilgen, 2006, p. 90).

Building trust within a team is recognized as a key ingredient for team success (e.g., Davis, Schoorman, Mayer, & Tan, 2000; De Jong & Elfring, 2010). Trust facilitates specific risk-taking behaviors such as reducing defensive control, open discussion of conflicts and mistakes, mutual feedback, and sharing of confidential information, which in turn should lead to more efficient coordination of team members' resources (e.g., time, effort, knowledge, etc.) (Breuer, Huffmeier, & Hertel, 2016). Robert et al. (2009) found that low levels of initial trust are predicted in virtual teams when team members have little past history and use CMC exclusively, which can limit direct personal observations that allow members to perform effective cognitive trust assessment. Even though swift trust, a presumptive form of trust, seems to exist in virtual teams (Jarvenpaa, Knoll, & Leidner, 1998; Jarvenpaa & Leidner, 1998), past studies found that swift trust appears to be fragile and often wildly inaccurate (Crisp & Jarvenpaa, 2013; Lewicki & Bunker, 1996; McKnight, Cummings, & Chervany, 1998; Meyerson, Weick, & Kramer, 1996). This represents a critical paradox for virtual group work (Wilson, Straus, & McEvily, 2006). Breuer et al., (2016) concluded in their meta-analysis that when virtual interaction is more frequent, team trust is more important for effectiveness. Consistent with this, empirical studies have found that interaction in computer-mediated groups is more task-oriented and less personal than interaction in FTF groups (Richardson, Maeda, Lv, & Caskurlu, 2017; Weidlich & Bastiaens, 2017). Computer-mediated teams were also found to struggle with their intra-team processes (Brahm & Kunze, 2012; Indiramma & Anandakumar, 2009; Staples & Zhao, 2006). FTF is very rich since it enables not only the spoken language and other verbal cues but also body language (Lantz, 2001). This gives the communicating parties a better basis for understanding each other compared to purely CMC (Lantz, 2001).

Our previous research results strongly reflected on the importance of intragroup trust, having a huge impact on the effect of communication style on performance. Not only does this trust improve overall performance, it also has a positive impact on other intragroup processes (Choi et al., 2018).

Peer learning. Members of a group learn new information from a variety of sources. External sources include literature reviews, textbooks and professors. One of the more effective sources is internal, that is, information coming from other group members (Mustafa, 2017). This is essentially the definition of peer learning. Children learn this source from an early age, and parents know full well that their own children often listen more carefully to their peers than themselves. Faculty members also know that peer learning is among the most effective sources for their students. That is why faculty consider peer learning as a desirable outcome and often structure their classes to include opportunities for students to interact to take advantage of this. These opportunities provide a major reason for the increase in group projects in classes, and this is true not just of business school classes (Mustafa, 2017). For example, many studies on peer learning take place within the health care community—medical and nursing schools carry on many research projects dealing with the advantages of peer learning (Göranzon, Lidskog, Freire, & Jansson, 2019, August; Tai, Canny, Haines, & Molloy, 2016).

Peer learning in higher education has been established as an effective learning strategy, assisting students to gain confidence in their own ability and taking control of their own learning (Keppell et al., 2011). Peer learning, when students learn with and from each other, is based on the principle that students learn in a more profound way by explaining their ideas to others and by participating in activities in which they can learn from their peers (McKenna, & French, 2011; Coates et al., 2017). Peer learning has been shown to enhance student learning and levels of self-efficacy (Brannagan, Dellinger, Thomas, Mitchell, Lewis-Trabeaux, & Dupre, 2013). Universities are very interested in students learning how to learn, i.e., to continue their educational process beyond the university experience. One way of learning how to extend their educational process is through communities of interest, an extension of peer learning. It, therefore, is a critical intragroup process with considerable interest as an important intervening variable between type of communication and the desired outcome of performance.

Communication types

Our focus groups found that traditional group interaction occurs in face-to-face meetings and involves two basic types of activities, namely, on-task (or the more formal activities occurring within a group) and off-task (or informal and more social types of activities) (Choi et al., 2018). We initially believed that students considered all communication choices as falling into two basic categories: FTF and CMC. Our first study involving focus group students indicated they considered the CMC category as being of two separate types, namely, the more formal and task-oriented forms and the more informal and off-task types. All three of our studies concluded that FTF interactions were more effective than CMC communication in large measure because they were able to accomplish both of these goals while any CMC interaction typically fulfilled only one of these two tasks. Our focus group students intuitively understood this difference when they broke down CMC communication into those methods that satisfied each of these two purposes of human interaction. As a result, we now consider three communication types that are used by students to interact within group settings. FTF exchanges are direct interactions with group members and form the basis on which in-class or in-person meetings provide direct communication exchanges. Virtual meetings provide more formal technology-based interactions with other group members and are used as a surrogate for FTF communication. Examples of virtual meetings include technologies like Zoom, Skype, texting, Google Docs, Microsoft Teams, and Blackboard. They seem to

accomplish the task-related aspects of FTF communication although they may not be as effective in fulfilling the more social, off-task goals for people within group situations. The students found CMC meetings to be more efficient since virtual meetings were more task-oriented; they had less off-task interaction; questions were more directly answered; and, no additional travel time was required (Choi et al., 2017; Denstadli et al., 2012). Empirical studies have found that interaction in computer-mediated groups is more task-oriented and less personal than interaction in FTF groups (Richardson et al., 2017; Weidlich & Bastiaens, 2017). Social media contacts, on the other hand, tend to be more informal and focus on fulfilling the off-task goals for groups (Crook, 2008, May 1; Selwyn, 2012). These communication interactions include, for example, Facebook, YouTube, Twitter, Instagram, TikTok and Snapchat.

A shock to all education, economic, social and global systems occurred with the COVID-19 pandemic. From their homes, people are generally saying: “Thank goodness for technology”, as it allows for people to interact with family and friends in ways that could not happen while being isolated at home. Technology, when compared to isolation, has been absolutely fabulous. For example, classes at all levels of education were translated into online versions when people were required to stay at home and not congregate in class-sized groups. Students and faculty alike were generally able to complete this semester. People clearly long for human interaction, and stock in Zoom and its rivals absolutely skyrocketed. Some basic questions arise: Are these interactions comparable to FTF communication? Do they satisfy interaction needs to the same or similar extent? Would people prefer Zoom to meeting in person? These are questions that will be asked and studied. Many universities are asking these questions right now to help determine the extent to which campuses may be opened in the coming months, assuming an appropriate level of health and safety can be achieved.

Most of the student evaluations and faculty feedback we have seen and are aware of indicate that people are generally fairly happy with the outcomes of this most unusual semester. Students did not lose a whole semester, they received credit for courses for which they have already paid, and they graduated on time. Another question might be how effective this recent educational experience was compared to previous educational coursework or FTF interactions with friends and family members. Did students learn as much as they might have while attending regular classes? Are people as satisfied as they would have been meeting friends and family in person? We believe there is one major mitigating circumstance in this situation, namely, faculty members did not have a full summer in which to change a course from offline to online, and that could make a huge difference. Most faculty members only had a weekend to transform their courses. Questions of experience here, however, must not compare technology-based interactions with the alternative of no classes. Rather, these questions must compare CMC with FTF communication options. Moreover, we must not forget that human interactions fulfill two basic needs. Satisfying only one of those needs dramatically limits the role of human interaction and shortchanges the fulfillment of human needs.

National culture and generalized trust

Neither of the two focus groups suggested to us that national culture would play any role in our initial study, nor should it become part of our model. Only after collecting data from Chinese students would we become sensitive to the part that national culture plays in how people perceive

technology and how it might be used by students in dealing with group members. Including the importance of national culture in affecting the choice and use of technology-based communication adds a significant layer to our model and, while adding complexity, moves it toward greater realism. We believe, therefore, that future research should include a cultural dimension.

National cultures, while describing general characteristics of a population, directly affect not only the choice of communication interaction needed, they also have an impact on the intervening variables described in this paper. Culture is used as the basis for examining business relationships between the West and the East (recently, especially China). And both Chinese and American cultures agree that trust is important in the development of these relationships (De Cremer, 2015, February 11). Trust is also important in influencing group processes and group performance (Alge, Wiethoff, & Klein, 2003; Mayer et al., 1995; Morris, Marshall, & Rainer, 2002). In particular, trust is regarded as an essential ingredient for cooperation (Putnam, 2001). People in individualist cultures are more cooperative with group members than those from collectivist cultures when groups are formed for the first time (Triandis, 1989). This occurs since the radius of trust in individualist cultures is much wider and group members are typically included within one's in-group (Delhey et al., 2011). Collectivist cultures influence people to have a very narrow radius of trust so very few group members will be part of their inner group. Chinese students, for example, need to use social media to increase their level of trust with group members for better group relations (Choi, Zeff, & Higby, 2019). People identify with established attitudes in collectivist societies, which then become part of their inner group circle (Smith, & Bond, 1993). On the contrary, members of individualist cultures, such as the U.S., have a wider radius of trust and, as a result, do not need to gain a further level of in-group trust. Which intragroup processes are used in any particular group situation is dramatically influenced by national culture and this variable is critical in understanding how people work in groups and their resultant performance levels.

Impact on intervening variables. In our conference with Chinese business leaders (Zeff, & Higby, 2017), we were impressed with their continual comments on how leadership style was very different between business leaders in the private sector of their economy and those who worked in State owned businesses. Not only did these two groups have to consider different criteria for decision-making, they were constantly considering different constituencies. These comments make it clear to us that leadership styles and decision-making processes are very important in determining group, company and even industry performance. In addition to leadership styles and decision-making as intervening variables, these Chinese automobile company executives were careful to indicate differences they noticed in how these two groups of executives communicated within their respective organizations and how they chose to rely on particular people to further communication efforts. They recognized, for example, how much information they shared with their subordinates and how they sought out suggestions and ideas from many people throughout the company. They also indicted their concerns for direct involvement of company personnel to ensure maximum participation rather than managers in State owned companies who had virtually no concern for sharing information with subordinates. They strongly believed that involvement of subordinates was essential to better management and higher performance. And unlike their counterparts in State owned companies, they had a direct individual benefit of participation in profit sharing and personal wealth increases. Growth and performance differences between the two types of company ownership (private and State owned) strongly supports the perspective of these executives (Zeff & Higby, 2017). Leadership style involves how group members are included

and what communication approaches are used within the group. Our conference participants from China were very clear, however, that communication approaches within groups were so important that they must be considered a major and separate concept in determining group performance. Besides the communication types used to interact with the group as a whole, (our original independent variable) individual interactions within the group with specific group members also influence group performance. And these business leaders were well aware of these relationships. Additional research needs to study these and, we suspect, many other intervening variables to more accurately reflect how groups function and perform at even higher levels.

DISCUSSION AND IMPLICATIONS OF MODEL

There are two major sets of implications of our Enhanced Research Model of Figure 4 above. Both implications are focused on the outcome of this model, namely, performance, on an individual and on a team level. The horizontal elements of the model provide important information to students and to faculty on how communication types impact various intragroup processes and the resultant outcome of both individual and team performance. This impact might inform faculty on relationships between these elements they may choose to impart to their students before groups are formed and team projects are assigned. Moreover, this provides important knowledge for students to learn for purposes of their entire career and performance on the job.

The second major set of implications deals with the vertical elements of Figure 4. In our globalized world, both economically and educationally, awareness of cultural differences is often what differentiates economic performance in the workplace. It is also a major goal for many educational institutions and systems. Sensitivity to diverse cultures, backgrounds and ideas is crucial to individual and team performance, both on school projects and on the job. This requirement of sensitivity has been highlighted in our daily lives through the renewed movement of Black Lives Matter, a further application of the need to be aware of and respond to diversity of our neighbors and team members in school, on the job and in our lives.

We are all living in a new world, with a pandemic overriding everything we do. All classes are now either fully online or have online components, and technology has become, for most of us, a major (only) way with which we interact with others. Part of this research will no doubt be applied to these experiences. Many people have already begun comparing their recent “online” experiences with previous FTF experiences. Surely, as we compare our “visits” with parents and grandparents, with ceremonies and rituals (e.g., a funeral of a very good friend in a faraway state in this country), there will be considerable differences. Are these differences of another level or another type?

One result of our previous research indicates that FTF communication is much more highly preferred than we initially expected. This is true for all samples in our previous studies. We were particularly surprised when graduate students have the same high preference level for FTF interaction while being on campus less frequently than undergraduate students (Choi et al., 2018). Likewise, we expected Chinese students to be much more interested in communicating via technological means than turned out to be the case. We expected there to be a higher acceptance of and preference for online, CMC, interaction. One reviewer suggested that may be a result of a predisposition of our students, who selected an on-ground delivery style as the main method of

class interaction, rather than more emphasis on online delivery approaches. This critique may not be applied to the Chinese student sample, however.

The impact of COVID-19 includes a huge dose of technology while people have been isolated in their homes for long periods of time. Not just hours on end, but days and weeks alone have forced people to find new ways to interact. If human beings are social animals, how do we find opportunities to meet with others when we are stuck inside our houses, wearing masks and staying at least six feet apart when we finally do cross the threshold by going through the door? Zoom and all of its counterparts have become more basic elements of our vocabulary. Most people would agree that technology has played a larger and a more critical role in our lives today than it did before the pandemic, even for those technologically attached people. Most educational systems, from pre-school through university graduate schools, have used some form of online education to fill the chasm created by “stay safe, stay home” directives from state and local government leaders. The impact and effectiveness of these experiences will become the focus for decision-making and educational planning for many years to come. We may need to make many decisions about the educational delivery systems for the upcoming school year, and the available technology, the types of communication interactions we have available, will play a key role. We have some very early research results that begin to inform our actions.

We start by looking at the state of online education before the coronavirus pandemic. A recent study of the highest-ranking person in the university responsible for online education, and conducted by Quality Matters and Eduventures -- a nonprofit group focused on ensuring quality in online education and a research and advisory group -- was completed in spring 2019 (Lederman, 2020, March 25). This survey found 60% of these online administrators indicated faculty had some training required before teaching an online course. However, only 30% indicated that students had any training or orientation. This suggests that it was an absolutely remarkable feat to transform all educational course delivery systems into online courses within a matter of days when education was physically shut down during COVID-19.

When considering results of online courses, two considerations need to be taken into account. First, there was an extremely short amount of time faculty had to translate their coursework into online formats. Rebecca Barrett-Fox gave the following advice to struggling faculty trying to cope with providing instruction to students in a blog with the title: “Please do a bad job putting your courses online.” She writes:

I’m absolutely serious.

For my colleagues who are now being instructed to put some or all of the remainder of their semester online, now is a time to do a poor job of it. You are NOT building an online class. You are NOT teaching students who can be expected to be ready to learn online. And, most importantly, your class is NOT the highest priority of their OR your life right now. Release yourself from high expectations right now, because that’s the best way to help your students learn. (Barrett-Fox, 2020, March 12, para. 1-2.)

Second, students responded to questions of their experiences with online education after schools closed down mainly by being grateful that technology allowed the semester to be completed and

many could still graduate, not by being critical of the quality of the education relative to what they were used to. According to a survey of over 3,000 students nationwide, Top Hat found that students very much appreciated the response to COVID-19's closure of universities by switching to all online coursework (70% thought their university did a good or excellent job in responding to the crisis), and the efforts of their instructional staff (66% of their professors did a good or excellent job in transforming the courses) (Kelly, 2020, May 1). This same survey found, however, that students found the quality of instruction to be well below what they received before the closure of school, with 68% of the students indicating that the emergency online instruction was worse than what they received before the crisis (Kelly, 2020, May 1). Moreover, 85% of the respondents missed the FTF interaction with faculty and 86% missed the interaction with other students (Kelly, 2020, May 1). Of concern to university presidents and those responsible for financial decisions, 26% of students were uncertain whether they would return to their school for the fall semester. Moreover, 25% of students indicated they had a worse opinion of their institution during this crisis (Kelly, 2020, May 1). The role of FTF interaction may or may not change as a result of a likely changed role of online learning in university settings in the near future. The need for research in this area appears to be even stronger to help faculty in their new attempts to upgrade and enhance their online presentations of course material.

Future research directions

Our enhanced research model provides many questions that beg for additional study. For example, peer learning has become an additional intervening variable and should be included in future attempts to better understand the relationship between the type of communication approach used and completion of group projects in classroom situations. It is also becoming more important in faculty's views of course outcomes, and therefore needs to be directly included in any research design for this topic. This also suggests that more research needs to study additional intragroup processes. As we gathered more data, we became sensitive to and aware of other factors that affected group performance based on what types of communication approaches are used by groups. Peer learning is only one of many potential processes that help groups enhance their performance. Literature reviews will help build a foundation for determining particular processes that will have an impact on team performance.

Critical questions coming out of our common and dramatic experiences recently, of course, deal with the impact of COVID-19 and Black Lives Matter. The world has changed, and interactions between people may be dramatically different as a result. Will people get used to CMC as a new norm? Will students ever return to a physical campus? Will students still have such a high preference for FTF? Will some cultures change their preferences while other cultures maintain their previous preferences? Will, in other words, the outcome of the horizontal section of our model produce a feedback loop to the vertical part of this model? Will age or circumstance modify these preferences? Will these experiences modify national cultural characteristics? Does national culture become much less stable over time now that these dramatic events have occurred? We hope that people will ask their own questions, although we are confident that these experiences will promote the opportunity and exercise of questioning by researchers throughout the academy and beyond.

When we sat down to go through the exercise of asking some of these questions, we also realized that these questions set up the possibility of creating a number of scenarios and trying to establish

hypotheses that might inform future research areas. We will take one of these scenarios to use as an example of how future research questions might be developed, using this newer version of our research model.

We would like to study the impact of one's experience within group situations on future perceptions of group processes and performance. For example, suppose an individual has an experience within a group situation. How might this experience affect this person's interaction with group members the next time he/she works within a group setting? Does this impact depend on the success of the group's performance? If the individual has a very positive experience, satisfaction levels are very high as a result, does the person have a higher intragroup trust level? Might this result be different if the individual comes from a national culture of high collectivism as opposed to a national culture of high individualism? Would level of collectivism change the impact of this experience? Let's walk through this scenario to see the different types/levels of impact that could be created.

We started to discuss how students' experiences might impact their future perceptions of intragroup trust and whether culture-based radius of trust might be modified as a result. Suppose, for example, we have eight different students that we will "track." Two students are from the United States, coming from a national culture with an extremely high level of individualism (Hofstede et al., 2010). These students began a particular semester with an exceptionally wide radius of trust (Delhey et al., 2011) and, as a result, intragroup trust is high. Student One has a very satisfying experience with the group project while the Student Two is dissatisfied with the group members. Students Three and Four come from Spain and likewise have a national culture resulting in higher individualism rather than collectivism and the corresponding level of radius of trust, although not nearly as strong as that formed in the US (Hofstede et al., 2010). Again, Student Three has a very good experience while Student Four ends up being dissatisfied.

There are four additional students that we "track" through this scenario: Students Five and Six come from China and start with an extremely narrow radius of trust based on a highly collectivist culture (Delhey et al., 2011; Hofstede et al., 2010). Student Five has an excellent experience while Student Six has a poor experience. Students Seven and Eight come from India, and while their national culture is more collectivist rather than individualist, their generalized trust is not nearly as limited as those students from China (Delhey et al., 2011; Hofstede et al., 2010). Student Seven has a positive experience while Student Eight has a negative group experience.

What is likely to happen to their views of generalized and intragroup trust? How much, if any, does their national culture get modified as a result of this experience? What would our hypotheses be as we collect data on these situations?

Hofstede suggests that culture is a very stable construct and will not be modified in the short term. (Almutairi, Yen, & Heller, 2018; Flory, Essers, & Touburg, 2016). We expect, as a result of our interactions with students during these studies, that there will be some situations in which cultural influences will be modified in the short term. In particular, if the cultural impact on a particular dimension is in the extreme, it will not likely be modified as a result of some experience. On the other end of this continuum, if a national culture has a much more moderate impact on one of the six dimensions of national culture, a specific experience may have a fairly large impact and modify

how much a national culture influences a choice of communication style or intragroup process. In our scenario, Chinese and Indian cultures are both more collectivist than individualist. As a result, Students Five through Eight all start with a narrower general trust level, as their belief in a more close-knit group is stronger and their radius of trust is more closely defined. Students Five and Six come from China, with an extreme level of national culture toward the collectivist end of the individualist-collectivist dimension. We expect for both Students Five and Six to maintain their expectations of intragroup trust given their beliefs that radius of trust is very narrow, regardless of whether they have a satisfying or unsatisfying experience in this group. The two students coming from India, however, have a less extreme view of the collectivist end of this dimension. We expect, therefore, that Student Seven with a positive experience in a group situation will modify his/her perspective regarding in-group trust and enter the next group experience with a more positive view of the other group members. Student Eight, who has a more negative experience, will also likely modify future expectations of trust level with other group members and have an even narrower level of radius of trust than the Indian culture initially suggests.

We come to the same conclusions when we consider the students from America and Spain. The United States has an extreme position along the individualist-collectivist dimension. We do not expect, therefore, for any experience, good or bad, to have an impact on views of ingroup trust. Spain has a very low level of individualism, although still on the individualist side of this dimension. The two students from Spain, therefore, will likely be influenced as a result of their experience during a group project. The Spanish student who has a positive experience likely will continue to maintain or even enhance their initial view of what to expect with intragroup trust. The Spanish student who has a negative experience during a group project will face a situation that was not expected. This student is likely to more strongly modify expectations of group members since national culture may not be strong enough to overcome the experience he/she has just had.

We summarize all experiences of these eight students by the following hypothesis: culture-based generalized trust (radius of trust) will more likely be modified with experience when the cultural influence along a particular dimension is not extreme. It will be enhanced when the experience is in the same direction of the initial expectations and changed when one's experience contradicts the expectation of the culture. It will be maintained regardless of one's experience (positive or negative) when the cultural impact is in the extreme (as is true in the case of the United States and China). Our overall null hypothesis might be stated as follows: no culture-based generalized trust is modified by experience. Our specific testable hypotheses would be:

H₁: When Hofstede's individualism/collectivism is moderate, for example, Spain and India, culture-based generalized trust will more likely be modified with experience.

H₂: When Hofstede's individualism/collectivism is extreme, for example, China and US, culture-based generalized trust will less likely be modified with experience.

As we look back at our research model, we find ourselves asking questions like: Do the vertical elements of the model more directly impact one or more of the horizontal elements? And, is there a feedback loop from the "Performance" element back to the vertical elements? Our hypothetical scenarios, for example, suggest possible modifications in national culture/generalized trust as a result of one's experiences. How strong might this feedback loop be and under what conditions

would we expect these modifications to take place? We seem to have our hands full with our future research stream, and we look forward to working toward collecting some answers to these questions.

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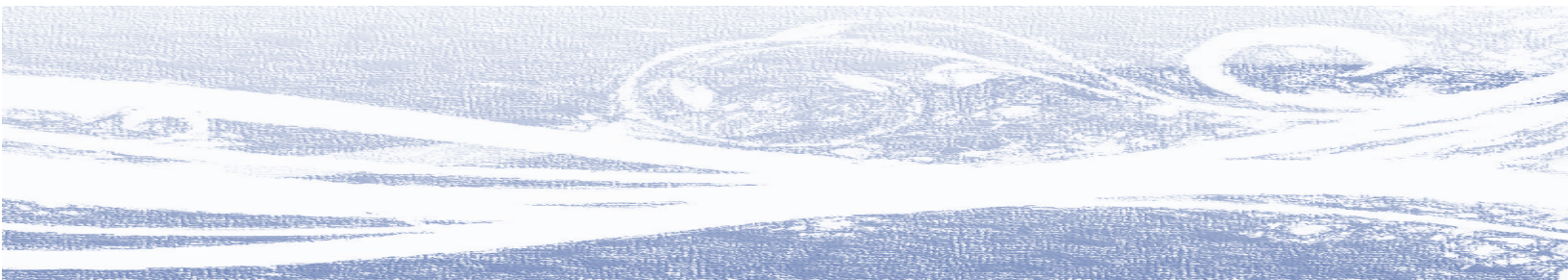
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