

# The Impact of Social Capital and Leadership on Performance in Distributed, Cross-National, Collaborative Learning Teams

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## ABSTRACT

A range of socio-technical factors influence performance in distributed teams. Trust and “social capital” are seen as amongst the most important of these factors. However, many studies have not taken into consideration sufficiently the impact of cross-national cultural factors on the development of trust and social capital in distributed teams. In this thirteen-week, quasi-experimental field study, we used a suite of web-based collaboration tools as the platform for a highly-interactive globally distributed collaborative learning environment. Within this learning environment, we investigated the impact of *group mode* (FTF vs. Distributed), *faculty mode* (FTF vs. Distributed), and *geographic location* (United States vs. South Africa) on group effectiveness, learning and development when performing unstructured tasks. In this initial analysis of the data, we found that students working in FTF teams had higher levels of satisfaction with the seminar and more trust in their teammates. However, they did not perform significantly better on a series of unstructured tasks than those in distributed teams.

## Keywords

Collaborative and cross-cultural learning, social capital, trust, CMC, long-distance collaboration, developing countries.

## INTRODUCTION

As distributed knowledge work becomes an increasingly important component of the global economy, many African and other developing countries are exploring strategies to meet the challenges and exploit the opportunities of globalization and the Information Society (Cogburn & Adeya, 1999). However, successful participation in this kind of knowledge-intensive global economy requires the appropriate knowledge, skills, and

abilities and is one of the most important elements of such a development strategy (Cogburn, 1997). Unfortunately, many African institutions lack the human and institutional resources to build these capacities alone. Partnering with US academic institutions may help, but these arrangements are sometimes costly and unsustainable. Further, many academics and scientists in developing countries feel isolated, and insufficiently involved in global research communities.

However, geographically distributed knowledge work and organizations forms such as a “collaboratory” can help to alleviate some of these problems. A “collaboratory” is comprised of both the application of information and communications technologies (ICTs) and socio-technical processes to operate as a laboratory without walls, and allows scientists, students, researchers, and workers to share equipment, data, resources, and collaborate over long distances (Wulf, 1989; Finholt, other cites).

However, working in this kind of globally distributed environment presents numerous challenges (Olsons 2000). These problems are perhaps complicated even further when they include participants from both developed and developing countries. Some of the challenges include building trust and common ground (Rocco, 2001, other cites), coordinating the activities of the distributed team, managing the inter-institutional and cross-national cultural differences, and variable experience with computer mediated communications (CMC). Is it possible to overcome some of these challenges to create globally distributed learning environments that utilize complex, cross-national learning teams in actual university course settings?

It may be that through the principled design of a highly-interactive learning environment and

pedagogical model that promotes collaborative learning, coupled with the expectation of regularized FTF faculty interaction some of these difficulties can be mediated.

A broad body of literature exists which explores the impact of various technologies and communications media on the work of distributed teams (key cites). Another important body of literature looks specifically at distance-independent and distributed collaborative learning. However, most of these studies have been conducted in laboratories and not across national and cultural boundaries in real academic and work settings. Some key expectations to this are xxx.??? As such, the impact of culture, institutions, time-zones, etc. may not have been as prominent as they would be in the conduct of real world globally distributed collaborative knowledge work.

Our broad goal is to better understand the socio-technical factors that affect the conditions under which scientists, workers, and students from the developed world can collaborate more effectively in geographically distributed knowledge work with those from the developing world. This understanding will help to strengthen our ability to build effective global research and learning teams, comprised of both developed and developing country participants. Further, this ability could create new opportunities for economic development within the context of a global knowledge based information economy.

From the literature, we know that there is a range of factors that affect group work in any environment. Some of the more important factors include, social facilitation (cite) and social loafing (cite); deindividuation (cite); leadership style (cite).

Other factors such as gender, racial and ethnic composition and national culture have also received a high degree of attention in the literature on group dynamics.

All of these factors can contribute to the degree of ease or difficulty of establishing common ground within a group (Clark ?).

Another aspect of group dynamics that is of interest to us is social choice theory (cite). Social choice theory suggests that individuals working in groups are constantly comparing their perspective to others in the group and may modify their beliefs accordingly. ?if a group has more radical perspectives, there is a higher likelihood that a more moderate person working within that group would also change their

perspectives/perceptions to slightly more radical views.

When we look specifically at the literature on distributed groups, we are particularly interested in the impact of cooperation and coordination, and discussion control. How do distributed groups organize their work, make decisions, and conduct their affairs.

Another interesting finding is that the degree of realism of the task can have an important impact on performance as well. (in this study we have tried to design very realistic tasks).

We are further interested in distance-independent and distributed collaborative learning. From this literature, we learn that...

Finally, we have explored the tools and social processes required to support the kind of distributed knowledge work under investigation here.

The data analyzed in this paper are from a long-term cross-national field study that empirically investigates the socio-technical factors affecting distributed knowledge work in teams comprised of developed and developing country participants. In this component of the study, we are comparing the experiences of groups of students working on realistic, unstructured decision-making tasks in both FTF groups and distributed teams.

## Research Questions and Hypotheses

Several key research questions are posed in this study. The primary quasi-experimental question for the field study is the following: in a *globally distributed collaborative learning environment*, what is the effect of: (1) Group Mode, (2) Faculty Mode, and (3) Geographic Location on satisfaction and group and development (i.e., social capital, trust, and the development of a learning community) when working on unstructured tasks over an extended period of time? We have developed four primary hypotheses from this research question:

**Hypothesis 1:** Students working in the *FTF Group Mode* will develop higher levels of social capital, trust and satisfaction than students working in the *Distributed Group Mode* and will have higher perceptions of their group as a "learning community."

**Hypothesis 2:** The presence of the faculty member will have a small but measurable effect on the satisfaction of the students working in *FTF Group Mode*. Participants from South Africa will be less

concerned with faculty presence than participants from the United States.

**Hypothesis 3** Participants from South Africa will have higher levels of satisfaction and social capital than their US counterparts and they will find greater value in their syndicates as learning communities.

**Hypothesis 4** High levels of social capital will be positively correlated with perceptions of the team as a “learning community.”

### Definitions

We define a *collaborative learning environment* as a highly-interactive pedagogical approach using web-based technologies to create an infrastructure to support the synchronous and asynchronous requirements of distributed learning teams. We define *globally distributed* as an event conducted across multiple timezones, countries and cultures involving participants from both developed and developing countries in their home environment.

For *Group Mode*, there are two possible conditions. In FTF Group Mode, all members of a group are participants at the same university and using voice, sight and shared tools to communicate. Distributed Group Mode means that all group members are virtual (not at university) and using audio only and shared tools to communicate.

For *Faculty Mode* there are also two conditions. In FTF faculty mode, the professor is physically at one university, but interacting with all students using audio, video and shared tools to communicate. In Distributed faculty mode, the professor is not physically at the university but interacting with all students using audio, video and shared tools to communicate.

For *Geographic Location* there are two conditions, those participants located at a university in the United States (University of Michigan or American University) and those students located at a university in South Africa (University of the Witwatersrand and University of Pretoria).

In the remainder of this paper, we present an overview of our quasi-experimental field study where *group mode* (FTF vs. Distributed), and *faculty mode* (FTF vs. Distributed) are manipulated, with *geographic location* being a third experimental factor (United States vs. South Africa). Second, we present the initial results from our study. Finally, we discuss the conclusions and implications of the study, with a comment about future research.

### Overview of the Study

This current study builds on a three year pilot study (1999-2001) in geographically distributed collaborative learning between the United States and South Africa (Atkins, Cogburn, et al; Cogburn and Levinson; Cogburn ). In this thirteen-week quasi-experimental field study, graduate students at two major research universities in the United States and two major research universities in South Africa participated in a thirteen-week seminar entitled “Globalization and the Information Society: Information, Communications Policy and Development.” The seminar ran from January –April 2002 (NB: Since this study is still in progress, this draft paper considers only the first six weeks of the data, the remaining data will be included in the final version of the paper.)

In the first seminar session, each student received three hours of contextually-based training on the collaboration tools to be used in the study (citation). These students were assessed, and deemed to be able to achieve an acceptable level of proficiency in the required skills. Next, at each university, students were randomly divided into two groups (Group 1, Group 2).

For the first six weeks of the semester students in Group 1 operated as a local FTF team (with all of their team members at their university). Correspondingly, for the first six weeks, students in Group 2 operated as a completely distributed team (with no more than one team member located at any university). Both sets of teams (FTF and Distributed) were comprised of 3-5 graduate students graduate students enrolled in major research universities in South Africa and the United States (there was one exception allowed for an advanced undergraduate student to participate in the seminar).

Following the initial training session, each week, the teams participated in a three-hour seminar session consisting of the following elements: (1) one hour introductory discussion and presentation of information and ideas to be used in the task; (2) one and one-half hour to engage in an unstructured decision-making task; and (3) thirty-minutes to report back on the assigned task.

In addition to manipulating *group mode*, we manipulated *faculty mode*. Each session the faculty member’s location changes, so in some sessions the professor is face to face with one group of students (some of whom are working in FTF others in distributed teams) and distributed with others (this is also why the term “distance-independent learning” is so appropriate for this seminar. However, the web-

conferencing tool that we used did allow the faculty member did broadcast Video over IP at a rate of  $x$  frames per second.

Also, while the faculty member moved around in this “circuit-rider” model, each university had an assigned site coordinator (usually an advanced graduate student or staff member) who was physically present in the lab during each session, and available to answer both logistical and substantive questions.



*Figure 1. Overview of typical lab configuration for each participating university.*

We were interested in measuring satisfaction with the seminar, group development (i.e., social capital, trust, and perception of the level of “learning community” development) and perceptions of the importance of physical faculty presence and absence. To measure these variables.

We were able to measure both the quality and quantity of team performance on the assigned weekly tasks, as well as the more formal mid-term paper and presentation. A range of measures were taken, including initial benchmarking measures of general social capital and trust; demographic information, and experience with CMC tools.

Based on the literature, we expected the FTF teams to have higher levels of satisfaction with the seminar and their team members. We also expected to find that both the quality and quantity of performance of FTF teams would be higher than distributed teams, with the diversity of opinions raised being higher in distributed teams (and thus higher levels of choice shift)

## THE QUASI-EXPERIMENT

### Design

The phase of the study uses a  $2 \times 2 \times 2$  factorial between subjects design with *group mode* (FTF vs. distributed), *faculty mode* (FTF vs. Distributed), and *geographic location* (United States vs. South Africa) being the factors. This phase of the study lasted for six weeks. There is a second phase of the study currently underway which is another  $2 \times 2 \times 2$  factorial between subjects design using the same subjects. At a later stage, we will combine the data from phases one and two and analyze the complete dataset as a within subjects design.

### Settings/Sites

Participants in the study were drawn from the graduate programs at four major research universities, two in the United States (University of Michigan School of Information and American University School of International Studies) and two in South Africa (University of the Witwatersrand School of Public and Development Management and University of Pretoria School of Public Management and Administration). At each university, a computer lab was prepared for the seminar. Each computer lab had the following common elements: Internet connectivity, Pentium III machines or higher, data projector, IE5, and the Centra Symposium™ client pre-loaded onto each computer. Each student was logged on individually to a computer, and had a headset and used a combination headset/microphone to speak and hear. Each site also had an assigned site coordinator, usually an advanced graduate student or staff member at the university. These site coordinators were employed by their respective university, and reported to the project director and professor for the seminar. The professor (lead author on this paper) has faculty appointments at each of the participating universities, thus no collaborative (or “team”) teaching was involved, although there were occasional guest lecturers that participated virtually (having no FTF interaction with any of the participants).

The highly-interactive globally distributed collaborative learning environment used in this study is based on both synchronous and asynchronous CMC tools. The primary synchronous tool is Centra Symposium™, which is a leading commercially-available web-conferencing tool ([www.centra.com](http://www.centra.com)). Centra symposium allows for the creation of a virtual seminar room, VOIP, video, mark-up tools, multiple types of content, websites, Windows movies, graphic images, PowerPoint slides, break-out rooms, and application sharing. The tasks were performed in the

break-out rooms. Additionally, Symposium features aids to interactivity and emotion (e.g., ability to raise your hand, indicate applause, indicate laughter, signal yes/no agree/disagree, and for more in-depth polling (both anonymous and authenticated; recorded and not-recorded). Further the symposium sessions were all recorded, and made available to the seminar participants asynchronously.

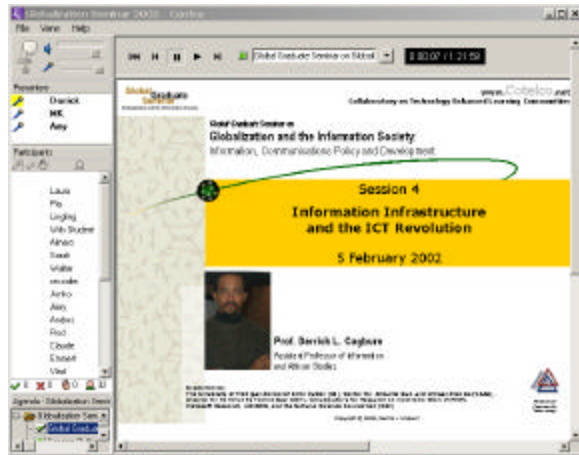


Figure 2. Screenshot of the Centra Symposium™ Interface from a recorded session of the Global Graduate Seminar, 2002.

We also made extensive use of presence awareness packages, such as AOL Instant Messenger, MSN Messenger, ICQ, and others (which we integrated through Trillian and all seminar participants had access to all of the other participants PA addresses.

In addition to these synchronous tools, we added UM.Worktools (<http://worktools.si.umich.edu/>) as a synchronous shared workspace for the seminar. The seminar and the project are managed under the auspices of the Collaboratory on Technology Enhanced Learning Communities ([www.cotelco.net](http://www.cotelco.net)). We used the weekly lab meetings of Cotelco so that faculty members, site coordinators, and technical support personal to raise questions, discuss the progress of the study, analyze data, critique relevant literature, and coordinate the overall seminar and research project.

### Participants

Forty graduate students participated in the study from the University of Michigan (n=6), American University (n=8), University of the Witwatersrand (n=19), and the University of Pretoria (n=6). There is a possible selection bias present in the study because these students self selected into the *Globalization Seminar* on their campus. However, on each campus,

there were advertisements placed in what were considered to be relevant departments and schools, as well as sent out to relevant e-mail lists. The students come from various disciplinary backgrounds, including the School of Information, School of International Service, School of Public and Development Management, and the School of Public Management and Administration. The subjects were not paid, but did participate for academic credit, continuing education, and a certification of participation.

### Tasks

All subjects engaged in three related tasks during the first half of the study, leading up to a more significant fourth (or mid-term) task. (NB: in the second half of the study, there are five tasks, leading up to a more significant sixth task). Each task was named separately (see table 1. below) but was similar in nature. Each was an unstructured, decision-making task, where the teams were asked to do each of the following: (1) decide on a stakeholder grouping in the world-system to represent; (2) engage in various strategy decisions about that organization, and how to influence external regime formation processes; and (3) to prepare two PowerPoint slides for presentation back in the main room to the entire seminar. Participants were told that these assignments were to be graded on the following criteria: (1) Style: grammatical correctness, quality of language, correctness of the spelling, and the appropriateness of the statement as a recommendation to the policy-making body; (2) Adequacy: the degree to which the recommendations effectively considered the problem and all its aspects; and (3) Persuasiveness: the degree to which a policy-making body would be influenced to accept the recommendation presented. Also, the participants were told that the five weekly tasks, were leading up to a more significant six session (mid-term task). This approach to realistic, meaningful tasks, leading to a more substantial concluding task was adapted from McGraw, et al (small groups as complex systems).

Since Rocco (2000) has shown that the use of get acquainted games can help build trust in distributed environments, and to minimize the differences in performance between FTF and Distributed groups, before beginning the first task, all of the teams went through a "Getting Acquainted Exercise." This exercise included two components: (1) a getting to know your group exercise; and (2) a team process exercise.

In each of the following scenarios, the groups were expected to develop and adopt the perspective of their syndicate grouping, and then develop a strategy to

influence GII/GIS Regime formation processes as outlined in the task instructions. The groups were expected to integrate the background reading for that week into their arguments. The names and focus of each of the three tasks from the first half of the semester are as follows:

**Task 1: WTDC Scenario:** In this exercise, you are to assume that your group represents the interests of an assigned stakeholder grouping (see Prof. Cogburn). As a group, you have been properly accredited and are planning to attend the upcoming *World Telecommunications Development Conference (WTDC)*, 18-27 March 2002, in Istanbul, Turkey. It has been four years since the last WTDC in Malta. You know that this meeting will be important for setting the international telecommunications agenda for the next five years, and you want to influence that agenda in a way that benefits your stakeholder group's perspective on Information Society regime formation. In the form of two power point slides, what would be the outline of your group's contribution from the floor during the opening session of the conference (i.e., when you go back into the main room)?

**Task 2: WEF Scenario:** In this exercise, you are to assume that your group represents the interests of an assigned stakeholder grouping (see Prof. Cogburn). The World Economic Forum (WEF) is about to hold its Annual Meeting, 31 January – 4 February, in New York City, with the theme "Leadership in Fragile Times: A Vision for a Shared Future." You know that this grouping of powerful leaders will play an important role in shaping the principles, values, and norms of the Information Society and you want to influence that agenda in a way that benefits your stakeholder group's perspectives. In the form of two power point slides, what would be the outline of a presentation to a meeting of your group's board of directors (i.e., when you go back into the main room) proposing a strategy for influencing this important gathering?

**Task 3: WTO Scenario:** In this exercise, you are to assume that your syndicate is aware of the importance of the WTO Doha Round of Trade Negotiations. You are particularly concerned about the impact of these discussions on the interests of your syndicate and stakeholder grouping. In the form of two power point slides, develop the outline of a *strategy* that you would present to your organization's leadership (i.e., when you go back into the main room) to best influence these negotiations?

**Task 4: Mid-Term Presentation**

The final task was to integrate all of the work from the previous scenarios into a 15-page paper and a 10 minute presentation. Participants were told that the final project was to be graded and that it would be worth 30% of their final grade. They were also told that each team would be able to critique and debate with the other about the points raised in their presentation.

### Questionnaires

Two questionnaires were administered in the study. The pre-test questionnaire collected demographic data on the participants (age, gender, nationality, language, education, and income) and baseline measures of their pre-existing perspectives on their communities and society at large – encapsulated as "social capital." We used many of the indices from the Putnam Social Capital Benchmark Survey (Putnam, xxxx).

The post-test questionnaire also had two parts and collected general perspectives on the seminar and the levels of trust and social capital developed within their syndicate teams. These measures of trust and social capital were taken from ( ).

In addition, seminar participants were asked to complete narrative evaluation essays, following a template of ten open-ended questions designed to assess the level of satisfaction with the seminar, their learning experience in the seminar, and the working style of their syndicate team.

### Procedure

At the beginning of the semester, an initial pre-test questionnaire was administered to the subjects using a web-based survey tool. Following this pre-test, participants engaged in a three-hour training session and were assessed on their performance on the collaborative tools.

For each successive week of the seminar participants attended a three-hour session of the *Globalization Seminar* in a computer lab located at their respective universities (there were occasions when a participant was allowed to dial-in from home/hotel, their office, or a cyber café). Participants gathered at their local computer lab and logged into the Cotelco Centra Server (<http://centra.cotelco.net>). From there, they were brought into the virtual seminar room. A site coordinator was always present to answer any substantive, administrative or technological questions.

For the first hour of the session, the professor engaged the students in a detailed discussion of the assigned reading material for that week, and probed

them for understanding of the concepts and issues to be encountered in the task.

Following a short break, the participants then went into virtual break-out rooms with their team members (both the FTF and Distributed teams) and were presented with the task instructions for that week, and any supporting documents or background material. The teams then had one and one-half hours to complete the task (which was an unstructured, decision-making task, requiring collective strategy development, more about each specific task below).

After another short break, the participants would come back into the main virtual seminar room and were asked to present the results of their assignment to the entire seminar. During the components of the session in the main virtual seminar room, live video of the professor was being broadcast to all of the participants.

During the sixth session, the teams were required to present the results of their six weeks of effort in the form of a 15-page strategy paper and 10-minute presentation. Following this session, participants were given the post-test questionnaire (again web-based) and provided with the template for their narrative evaluation essay.

### Measures

The variable *Group Effectiveness* was measured by the “expert” evaluation of the product of the teams. Teams were given the following criteria by which their presentations would be judged: (1) style; (2) adequacy; and (3) persuasiveness.

The variable *Group Learning* was measured by survey questions asking the participants for a self-reported measure of the degree to which their syndicate became a learning community, and ranking their team members. Further, measures of *Group Development* included questions on the degree of perceived social loafing within a syndicate (following citations).

Finally, *Social Capital* is measured by indices from the Putnam Benchmark study and other CREW surveys of trust in distributed teams.

### Statistical Analysis

We have used descriptive statistics, simple Analysis of Variance (ANOVA) and multivariate regression analysis to analyze the quantitative data. We have used N5 to analyze the qualitative data.

## RESULTS

Since we are using a quasi-experimental design, we are assuming the existence of non-equivalent groups. The results are presented in four sections corresponding to our four study hypotheses using our qualitative and quantitative analysis. The first section presents our analysis of hypothesis one that Students working in the *FTF Group Mode* will develop higher levels of social capital, trust and satisfaction than students working in the *Distributed Group Mode* and will have higher perceptions of their group as a “learning community.” The second section presents our analysis of hypothesis two that the presence of the faculty member will have a small but measurable effect on the satisfaction of the students working in *FTF Group Mode*. Participants from South Africa will be less concerned with faculty presence than participants from the United States. The third section presents our analysis of hypothesis three that participants from South Africa will have higher levels of satisfaction and social capital than their US counterparts and they will find greater value in their syndicates as learning communities. And finally, section four presents our analysis of hypothesis four that high levels of social capital will be positively correlated with perceptions of the team as a “learning community.”

### Group Development and Leadership

We hypothesized that students working in the *FTF Group Mode* will develop higher levels of social capital, trust and satisfaction than students working in the *Distributed Group Mode* and will have higher perceptions of their group as a “learning community.”

[insert analysis of ftf v distributed here]

Three different work styles emerged within the study. The first is that a “strong” leader emerged within the team. The second style exhibited a more highly cooperative leadership approach. No “strong” leader emerged within this approach. The final style was more distributed style, in that there was no “strong leader” but the work was divided amongst the team members and put it together at the end. Some have called this the “staple method” of collaborative work.

For example, in *Style 1*, some leaders emerged in the syndicate; not all members participate sufficiently. A female participant from the South Africa working in a distributed team said that:

The work styles varied from complete non-engagement (of all syndicate meetings both in class and outside class time) to an attempt to engage with the

syndicate but struggling with the technology (attending all meetings during class time but none outside of class, and only responding to a few emails) to total commitment. There were two leaders in our group, and they were chosen because we were the two people who made the major commitment.

The second leadership style that emerged, *Style 2*, was highly cooperative. In this style, no strong leaders emerged, and assignments were completed through consultation. For example, a female participant from the United States, working in a FTF group said that, "The work style...can be best described as being highly cooperative....there was no one single leader of the group....decisions were often collectively made, consistently re-evaluated, and constantly discussed amongst group members." Another male from South Africa working in a FTF Group said that, "Discussions were conducted and decisions made in consultation." Another male from South Africa working in a distributed team said that, "It was democratic....decisions were made of a collective nature."

Finally, in the third leadership style that emerged, there was no clear leader. Work in this style was divided evenly. Syndicates taking this approach divided their assignments evenly, asking each member to get work done individually and then they put the project together at the end. In this case the communication and sufficient commitment are quite crucial. If any of the members fails to accomplish his part, it would be a problem to the whole group. One female student working in a distributed team, described her syndicate work process as, "The group decided to equally distribute the sections of the assignment...and then convene to collate the work done...". Another female participant from the United States working in a distributed team said that:

...one of my team-mates finally delegated specific portions of the papers...and gave the rest of us a deadline,...I turned in my part of the work on time, but we were still unable to present on the day everybody presented because my team-mate was unable to upload our presentation. I was frustrated because I felt we failed to work effectively as a team...

On average, participants in collocated teams reported more participation than their counterparts working in distributed teams, but a strong leadership was harder to achieve in distributed teams. Students working in a

face-to-face manner are more likely to describe their assignment as a collective outcome, and more to appreciate other members' commitment.

Interestingly, when asked about their own leadership role in their team, the vast majority of the participants (94%, n=12) said that they took a relationship focused approach to leadership (i.e., "In our discussions, I suggested how we could all work together better. I made sure that everyone in my group was listening to one another."). In contrast, only a small number (23%, n=43) said that they took a task focused leadership approach (i.e., "I took charge of what the group should do during our assignments and meetings. I gave directions on how we should accomplish our goals."

The distributed teams were more diverse in their work process. All of the three leadership styles can be found in the distributed teams. However, evaluation papers from students present an interesting finding that **an initial effort is considered significantly important in global syndicates**. The reason partially lies in that people always hesitate to talk first before they know who they are going to talk with. For example, a male participant from the United States working in a distributed team said that, "...Silent was the prevailing factor in our group, and it honestly took me some time to realize that nothing would get done without someone taking the initiative to break that silence...". Another female from the United States working in a distributed team said that, "...I often took the initiative in emailing my group about the need to organize our ideas and getting things done on time...". A female participant from South Africa working in a distributed team said that, "...ideas, suggestions and volunteering seem to come from one person. The females seem to take the initiative. If it were not for the ladies, I doubt if the group would have been able to submit and or even attempt a presentation..."

In this sense **leadership may be more crucial for global teams**, although the process is difficult and not necessarily successful. For example, a male participant from the United States working in a distributed team said that, "...however, none of us proved to be a strong leader (which we needed) and that made things somewhat difficult..."

Another male participant from the United States working in a distributed team said that, "Finding a syndicate leader was a trying process...I felt uncomfortable pushing my group members in directions that they did not want to go...but the

complete absence of articulated alternatives left me little choice...”

### Faculty Presence and Absence

We hypothesized that the presence of the faculty member will have a small but measurable effect on the satisfaction of the students working in *FTF Group Mode*. From our analysis of the participant evaluation essays (n=12) we find that this hypothesis is confirmed.

Most of the participants in the study did not perceive any major difference in the seminar whether the faculty was present with them or not. A large number of participants (50%, n=6) reported that there are no significant differences in the seminar when the faculty member was present at their location and when he was absent. In fact, two participants (22%) reported that they actually preferred the seminar when the professor was participating from a remote location. On the other hand, several participants (25%, n=3) reported that they preferred the seminar when the professor was participating from their physical location.

For example, one female student from the United States participating in a distributed team said that, “I actually believe that the professor’s physical presence made no difference in terms of the lecture of the session. I never felt that the professor’s physical absence had any sort of negative impact on the lecture.” Another participant in a distributed team, a male from South Africa said that, “there is definitely no need for [presence] based on the nature of the seminar.” Further, a female participant in a FTF team from the United States said that, “if the learning environment is technologically well-supported like this seminar, I do not feel any big differences between physical and remote location.”

Another male student from the United States, participating in a distributed team, expressed strong preferences to the absence of the professor. He argued that he would feel freer to listen more when the professor is participating from a remote location. “...when you were present it was hard to pay full attention, because of the echo and you were loud....when you weren’t physically located, it made it easier to listen and participate.”

Given that this is the first time participating in such a new kind of learning experience, some students felt a little bit isolated, and that it was not as convenient as in a traditional classroom to be able to contact the instructor. According to one of the subjects, a female from the United States working in a distributed team,

the instructor seemed to be easier to access when he was FTF, and she felt less inhibited to communicate with the instructor, when he was physically located with the students. She said that, “he seemed more accessible and I was more comfortable asking questions...”.

However, the design of the study was to try and mediate the impact of distance for the remote participants by making presence awareness packages widely available and used within the seminar through “virtual office hours.” Apparently this was successful for some of the participants. One subject, a female participating in a FTF group in the United States said that:

This is my first experience of remote learning. Honestly speaking, I was afraid that it might be difficult [to] communicate with the professor after the class. However, the professor’s virtual office hours and quick e-mail responses made me feel that I am not isolated. I think that Centra Symposium and [the] other tools overcome the miscommunication [that is] supposed to be anticipated in [a] remote learning environment

Thus, we find that it is important for the instructor to encourage students to contact him by announcing his virtual office hours before each session starts, and for the virtual office hours of the site coordinators. Another possible, but expensive, way to have an impact on faculty presence is, as one student recommended, a “team-teaching” approach. This would be a collaborative teaching as well as learning design, similar to the one employed by Contractor et al in the Quad-cities project, with one professor from each university participating in the seminar.

However, some students still prefer the physical presence of the faculty member. For example, one male student from the United States participating in a distributed team argued that that the seminar session was more productive for him with the faculty member present. He said that, “I benefit enormously from the nuances of live interaction and feel that face-to-face communication invites dialogue...”.

One small group of students from South Africa were operating in a completely distributed manner, and were not able to meet the professor FTF at all. One of these students, a South African male remarked that the experience in the seminar would have been different had they been able to meet the professor,

especially when they had technical problems and crashes.

Although people disagree with each other on the impacts of faculty presence or absence, a significant part of them seemed to reach a consensus on the positive effects of faculty presence. Among the six that had no preferences, half acknowledged that they would like to meet the instructor for at least once.

Video is supposed to facilitate disseminating the presentation when the instructor is not present. We did provide faculty live video in our virtual classroom—Central Symposium. Students on all sites could get some clues by watching the instructor’s video, if they preferred to attend the seminar “face” to “face”. Unfortunately none has assessed or reported so far the video impacts on their learning process or outcomes.

We also hypothesized that participants from South Africa will be less concerned with faculty presence than participants from the United States. This hypothesis is not supported by the data. We found no significant differences between participants from South African and the United States in their preference for faculty presence and absence. Table 1 below presents a summary of the perspectives on faculty presence and absence, with reference to the geographic location, gender and group model.

	Total	No significant differences	Prefer presence	Prefer absence
Global syndicates	9	4 (44%)	3 (33%)	2 (23%)
Syndicates	3	2 (66%)	0	0
US	7	3 (43%)	2 (30%)	1 (14%)
SA	5	3 (60%)	1 (20%)	1 (20%)
Male	5	2 (40%)	2 (40%)	1 (20%)
Female	7	4 (59%)	1 (14%)	1 (14%)

**Learning Communities**

We hypothesized that participants from South Africa will have higher levels of satisfaction and social capital than their US counterparts and they will find greater value in their syndicates as a learning community.

Based on our analysis of the qualitative and quantitative data, this hypothesis is supported. Table 2 below presents an overview of the analysis of

	TOTAL	+ (75%)	- (25%)
Distributed Group	9	6 (66%)	3 (33%)
FTF Team	3	3 (100%)	
Male	5	4 (80%)	1 (20%)
Female	7	5 (70%)	2 (30%)
US	7	4 (57%)	3 (43%)
South Africa	5	5 (100%)	

Generally speaking, most students (75%), from both global and collocated syndicates, agreed that their syndicate members contributed to the teamwork, and they benefited from discussing with other members. One female participant from the United States working in a FTF team said that, “discussion and collaborative work with syndicate group members were great opportunities for me to consider the global issues....I learned from them a lot...”

Most interestingly, students from South Africa valued their syndicate significantly more than those from the United States. All of the participants from South Africa that submitted the evaluation essay appreciated the contributions of other syndicate members to their own understanding of the seminar. In contrast, the participants from the United States had more diverse attitudes to viewing their syndicates as learning communities.

Although the distributed team members disagreed on the overall contributions of other members, they acknowledged that distributed teams had two major advantages over collocated ones. One benefit, according to some, is the excellent opportunity to learn how to communicate with teammates that are in different geographic locations and time zones. For example, one female from South Africa participating in a distributed team said that, “...I learned about the complexities of working in a team, across time zones, and with different levels of technical competence...I learned about the advantages of technology in work, and I learned about its disadvantages...”. Another male from the United States, working in a distributed team, said that, I think I had a great group. We learnt a great deal about group dynamics and how people have to work in a globally distributed environment...”.

More interestingly, global syndicate members were significantly more impressed by and satisfied with the diversity of the whole syndicate's academic background and work experiences. One male from the United States participating in a distributed team said that, "...each group member was knowledgeable in various areas so leaning new material was never really an issue." Another female from the United States working in a distributed team said that, "Working with my syndicate was an interesting experience. I have never worked with a group who was not in my physical location before...both of my group members were older and had a fair amount of experience working in the field, I was able to learn a great deal from both..."

Though the majority of the participants viewed their syndicates as learning communities in which individuals can get help and learn from one another, there are still several students reporting to obtain much less from their syndicate members. What strikes us here is that all the "least satisfied" participants were from distributed teams. They complained the most about the reluctance of their team members to participate in meetings outside of the regularly scheduled sessions. They also found that the distributed team members contributed insufficiently to the collaborative efforts of other syndicate members. Another very important finding, is that they did not attribute these failures to either technical challenges or the proficiency of other members, but to some "personal" factor. One female from the United States, participating in a distributed team said of her distributed teammates that, "...I am sure they are valuable resources, but I have not received much information from them." Another male from the United States, working in a distributed team said that, "...I felt like it was a constant battle to keep my group together...". Another male from the United States working in a distributed team said that, "...one of our group members was particularly hard to track down, rarely returned email and seemed largely absent from the group process...". A female from the United States participating in a distributed team said that, "...I did not feel that my team was effective in communicating...I hope my complaints are not perceived as direct attacks on my team members...". Notice that these comments are all from participants from the United States that were working in distributed teams.

When referring to the university location, universities in South Africa reported more sense of learning community than those in the U.S. And there is no significant difference between female and male students concerned with satisfactions.

### Impact of Social Capital

Finally, we hypothesized that high levels of social capital will be positively correlated with perceptions of the team as a "learning community."

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