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Preparing Technical Communication Students for their Role in the Information Economy: Client-Based Virtual Team Collaboration between Irish and US Students

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Abstract

Effective leadership is crucial to the success of global virtual teams. Team leaders have many responsibilities and face many challenges. Leaders must provide structure for team members and find ways to personalize virtual work relationships. Often, leaders of virtual teams are also charged with the responsibility of media selection and of helping team members adapt to the technologies being used for virtual collaboration. Studies of leadership can be roughly divided into two categories: 1) studies that examine the behaviors of practitioners charged with leading virtual teams in the workplace; and 2) research conducted with students participating in virtual team projects. This study examines a client-based virtual team collaboration between students at the University of Limerick (UL) in Limerick, Ireland and students at the University of Central Florida (UCF) in Orlando, Florida, USA. This paper focuses on our analysis of designated and emergent leaders during the project.

Keywords: virtual teams, online collaboration, and distributed work models.

Introduction

Virtual teams are being used by corporations with increasing frequency. However, research on virtual teams is still in its infancy. To date, research on virtual teaming has focused on issues of trust and on the challenges most frequently encountered by members of virtual teams [1,2,3]. These challenges are typically related to culture, technology use, communication, and project management [4].

More recently, researchers have begun to examine leadership roles in virtual teams [5,6,7]. Team leaders have many responsibilities that are crucial to the success of virtual teams. Lurey and Raisinghani (2001) emphasize the important role leaders play in establishing effective team processes and in facilitating collegial relationships among team members. Bell and Kozlowski (2002) state that team leaders are responsible for building

a team's culture by establishing mutual respect and obligation among team members.

For the most part, studies of leadership have either focused on the behaviors of practitioners charged with leading virtual teams in the workplace or on the behavior of students participating in virtual team projects. This study examines a client-based virtual team collaboration between students at the University of Limerick (UL) in Limerick, Ireland and students at the University of Central Florida (UCF) in Orlando, Florida, USA.

The students worked together to develop a web site and program brochures for the University of Limerick's graduate programs in Technical Communication and E-Learning. The project was designed so that students were both *developers* of information and potential *consumers* of the information that they were developing. Both quantitative and qualitative data was used to examine designated and emergent leadership roles; we paid particular attention to attempts by leaders to establish structure, to encourage collegiality, and to motivate participation.

Literature review

While earlier research on virtual teams focused on the challenges faced by members of virtual teams and on the development of trust, more recent research has examined other aspects of virtual collaboration; numerous studies have analyzed leadership in virtual teams and the role leaders play in the selection and use of various communication media by members of virtual teams. Studies of practitioners often attempt to identify those behaviors that facilitate successful collaboration within virtual teams. Kerber and Buono (2004) argue that virtual team leaders "need to be more aggressive than leaders of conventional teams" in creating structure and routines and communicating this structure to team members. They also identified the need to build strong social relationships among team members as one of a leader's greatest challenges.

Hambley, O'Neill, and Kline (2007) conducted comprehensive interviews with nine virtual team leaders and members from six different organizations. The

findings from their study suggest that “leadership is critical in virtual teams”. Much like Kerber and Buono, they found that for virtual teams to be successful, leaders must find ways to personalize virtual work relationships both between team members and the leader and among the team members themselves. Leaders must find ways to create group cohesiveness which is linked to a number of positive outcomes in virtual teams including enhanced motivation, more open sharing of information, and increased member satisfaction [10,11].

The development of strong relational links among team members increases the satisfaction of individual team members; relational links are developed as a result of socialization within teams. One important consideration when studying virtual team interactions is that relational intimacy may take longer to develop in virtual settings than in face-to-face collaboration [12]. Therefore, team leaders must find ways to structure interactions and motivate supportive team member relations from the inception of the collaboration.

Another important responsibility faced by leaders of virtual teams is media selection. Often leaders are charged with selecting the media their teams will use. Most teams use a combination of technologies to communicate with one another, exchange files, engage in social discourse, and make decisions [6]. It is important for leaders to recognize the abilities and limitations of various technologies when selecting media [13]. Rich media communication channels (face-to-face meetings, videoconferences) are not always available to teams; team leaders need to help team members adapt to other technologies [7].

Just as practitioners in virtual teams must learn to adapt to the demands of team work and to find ways to build and maintain social relationships in the absence of face-to-face meetings, so too must student members of virtual teams. In reporting on a case study of a collaboration between U.S. and Swedish students, Paretto, McNair, and Holloway-Attaway (2007) note that despite the technological sophistication of most students today, they are still not prepared for the challenges of virtual collaboration. They argue that students need instruction that “enables them to manage collaboration themselves”.

Most studies of leadership in student virtual teams look at the emergence of leaders from within the teams. In a study of students at Murdoch University in Australia, Sudweeks and Simoff (2005) found that emergent team leaders sent more messages that were task-related than other team members. Ocker (2007) studied dominance in virtual teams; she distinguishes dominance from leadership by stating that while some leaders may be domineering, a dominant individual in a team will not necessarily exhibit leadership behaviors. Leadership behaviors include task-related behaviors like defining/assigning team members’ responsibilities and

coordinating team activities. As we have seen in research with practitioners, other important tasks for leaders include: selecting media, helping team members adapt to the media being used, and fostering social relationships in the absence of face-to-face interaction.

This study examines a client-based virtual team collaboration. Although the students functioned as one large virtual team to create a web site and brochures, they were also assigned to sub-teams within the larger group. While some leadership roles were assigned for the team as a whole, individual sub-teams were free to determine whether or not to select a team leader. Three leadership roles were assigned: two project managers and one project editor. These three roles were assigned at the discretion of the instructors based on the abilities and interests of the students chosen.

Methodology

Over a ten-week period in the Fall semester of 2007, eighteen students participated in virtual team collaboration, twelve from UCF and six from UL. The UCF students were senior undergraduates, majoring in English or Technical Communication. Five of the six UL students were postgraduates, pursuing a skills conversion program in either Technical Communication or E-learning, while the sixth was a senior undergraduate pursuing a Bachelor’s degree in New Media and English. Since the UL students came from a variety of interdisciplinary backgrounds, they were not necessarily more advanced (in terms of knowledge and expertise) than their UCF counterparts, though they were older and had more life experience.

This research builds on a previous study by the authors in which Irish and US students worked in virtual teams to create web sites on intercultural communication. In our previous study we found the student teams that had defined leaders and structured meetings were both more successful in their product and more satisfied with the process. For this reason, we assigned team leaders and gave students more structure in this iteration of the project. We also allocated marks for professionalism and for recording the minutes of meetings. The main focus of our analysis in this study is the role that leadership plays in the virtual team experience.

The project

The project was a client-based collaboration, where the students worked together to redesign the UL Technical Communication Section web site, and brochures for the Section's programs. As such, the UL faculty members were clients as well as teachers. The client's main requirements were that the site should be well-designed, it should have an intuitive navigation system, and it should have a stronger marketing focus to

promote the Section and its programs. The clients also requested attractive brochures that should be accessible via the web site.

For the UCF students, the virtual team project was part of a course in Documentation and Client-based Collaboration, while for the UL students the project was part of a course in E-Learning Design and Delivery.

The teams

We divided the group into four sub-teams. We based sub-team compositions on a combination of students' expressed preferences, the project requirements, and our understanding of each student's aptitudes. The teams were divided into three content development teams and one design and editorial team.

The top-level content development team (TLCDT) was responsible for researching and developing the top-level content for the site, including faculty biographies, research information, news, alumni profiles, and Section policies.

The program-level content development team (PLCDT) was responsible for researching and developing content to describe and promote three academic programs run by the Section.

The brochure content development team (BCDT) was responsible for researching and developing content for three brochures (one for each of three programs offered by the Section).

The design and editorial team (DET) was responsible for editing the content of the web site and brochures, and for the design and implementation of the web site and brochures. Unlike the other three teams, this team did not produce any content.

Team roles

All sub-teams had a common aim, to collaborate together and liaise effectively with the client to produce high quality materials. Two project managers were assigned to the project, both based in UCF, due to limited student numbers in UL. The project managers were members of content development teams, though they had reduced content development roles to afford them time to oversee the successful completion and implementation of the project. Table 1 summarizes the team roles.

Table 1: Summary of team roles.

Top-level content development team (TLCDT)	Program-level content development team (PLCDT)	Brochure content development team (BCDT)	Design and editorial team (DET)
2 UCF and 2 UL participants (including one project manager)	5 UCF and 1 UL participants (including one project manager)	3 UCF and 1 UL participants	3 designers (two UCF, one UL) and 1 editor (UL)

Communication channels

Students used the following technologies for both synchronous and asynchronous communication during the project:

- Sulis (the UL name for Sakai) was the Virtual Learning Environment (VLE) used for the project. We created a worksite for the project, where students could have synchronous online chats and asynchronous discussions, exchange files, and post announcements and resources. Within this shared worksite, each sub-team had its own resources folder and discussion forum, which they used actively.
- Skype, an online telephone software tool, was available to students in a lab environment, and enabled them to hold team meetings in synchronous online teleconferences and to exchange files.
- Videoconferences were an essential face-to-face communication tool. We held two videoconferences at the start and one at the end of the project.

We discouraged the use of email because it lacked the transparency of the other tools. Since all teams were working towards a common goal, it was important that they share resources and information.

Each group was required to participate in several meetings:

- Our previous research [17] revealed that students were intimidated by having to participate in a videoconference for the first time while also meeting their teammates for the first time. Therefore, we set up an initial videoconference where students were primarily observers. During this videoconference, the teachers/clients at UL gave details of the project and the teacher at UCF gave the students directions for the following week's videoconference.
- In the second videoconference, members of each team began to get to know one another. During this synchronous team meeting, students performed

several structured tasks and selected the date, time, and medium for their next team meeting.

- Students had to hold at least one team meeting each week and post the minutes online. They had a choice of using either Skype or Sulis for their team meetings.
- On completion of the project, students participated in a final videoconference, during which they discussed their experiences, the challenges they faced, how they addressed those challenges, and what they learned from participating in the project.

Deliverables

In addition to the web site and brochures, the students produced the following deliverables:

- Proposal: each team had to write an initial proposal, describing the scope of their team's involvement, their resources, project management strategies (including a definition of team roles and how they planned to work as a team), a schedule for completion, and a list of their qualifications.
- Team meeting minutes: each team member had to take minutes for at least one team meeting and post these in the resources area of the team's worksite.
- Individual reports and project logs: on completion of the project, each student had to submit a report describing his/her experience of the virtual team project, and append a project log which accounted for how much time was spent during the project.
- Students were also graded individually for their professionalism throughout the project; this grade also took into consideration their attendance at videoconferences.

Research instruments and data analysis

In this paper, we discuss the data we gathered about leadership from students' use of the Sulis discussion forums. For the project, we set up discussion forums for: each content development team, the design and editorial team, project managers, general project questions, and questions for teachers and clients. Sulis also includes a student lounge forum which students can use for off-task discussions. We conducted both quantitative and qualitative analyses of the content of the discussion forums.

The quantitative analysis of postings enabled us to determine:

- The number of discussion postings per team and per student.
- The number of discussion forum postings by students in designated leadership roles (one editor and two project managers).

Our quantitative analysis also enabled us to identify potential emergent leaders, based on the number and types of messages they posted.

The qualitative analysis of discussions enabled us to examine the nature of messages posted both by student leaders and by other team members. Research on leadership in virtual teams has found that team leaders send more task-related messages than other team members [15]. They send messages that define/assign team members' responsibilities and coordinate team activities [16]. For the purposes of our study, we define team leaders as those individuals who send a (significantly) larger number of messages than other team members and whose messages are task-oriented and relate to the coordination of team activities. Therefore, we coded discussion messages according to whether designated and emergent leaders sent task-related messages or not, whether the student initiated the discussion topic, or responded, and whether the student co-ordinated team activities or not.

Our previous research [17] highlighted the importance of socio-emotional communication in team formation and success. Therefore, we were interested in the link between students' socio-communication communication strategies and their leadership skills. We examined the data to determine whether *designated* or *emergent* leaders posted messages that sought to establish social relationships between themselves and team members. We were also interested in how designated and emergent leaders communicated about technology.

Results

The average number of messages posted by the 18 students is 18, but the number of messages varies considerably from 1 to 50 (see Table 2).

Quantitative and qualitative analysis of designated leaders' messages in Sulis

Designated Leader 1 (Student 16) was one of two designated Project Managers based in the United States. In addition to her project management role, she was also a member of the TLCDT, with reduced content development responsibilities. Designated Leader 1 (DL1) posted 38 messages in total: three of these were duplicated across several forums. She initiated 18 messages (including duplicated messages), across all forums except the student lounge. Four of the 38 messages were responses to editorial queries about her own content, and were not related to project management activities. She posted two messages in the teacher/client questions forum. There were also two peer-to-peer (project manager-to-project manager) messages.

Table 2: Total number of postings per student.

Student 1	17 messages
Student 2	4 messages
Student 3	11 messages
Student 4	15 messages
Student 5	7 messages
Student 6 (EL1)	27 messages
Student 7 (EL2)	26 messages
Student 8	10 messages
Student 9	1 messages
Student 10	18 messages
Student 11	9 messages
Student 12 (DL3)	49 messages
Student 13	10 messages
Student 14 (DL2)	50 messages
Student 15	10 messages
Student 16 (DL1)	38 messages
Student 17	7 messages
Student 18	8 messages

Her messages were always formal, revealed no personal information, and none evinced evidence of social communication. Her greetings and closing remarks were friendly and positive. Typically, she concluded messages with a statement such as: “Thank you for time and have a great day!”

DL1 promoted group cohesion by giving positive affirmation to her team-mates. Examples of her affirmative comments include:

“I would like to say great job with keeping a professional, clear, and articulate tone.”

“Great job, Thank you for posting minutes!”

“Wonderful, Thank you for posting the discussion for us all to peruse. Sounds rather productive.”

DL1 posted two planning and scheduling messages towards the end of the project to organize meetings and documentation submissions. These messages too were formal, but helpful and friendly:

“Please email your final drafts as soon as possible with the correct file naming scheme. Do not hesitate in contacting your team leader, the Project Managers, or the Design Team directly if you have any questions or concerns.”

She posted just one off-task message, a reply to another student’s introduction (in the student lounge forum) at the start of the project, and did not post any message introducing herself.

Designated Leader 2 (Student 14) was also based in the United States. He too had a reduced content development role but he was a member of the PLCDT.

Designated Leader 2 (DL2) posted 50 messages in total but initiated 35 messages, 34 of which were task-related. One message was an announcement.

He posted 12 messages related to meeting planning and scheduling, including one message that included a

meeting agenda. Some of these messages included persuasive language to urge his teammates to attend scheduled meetings, such as the following: “We are required to hold at least one meeting per week. Therefore, we need to all agree on a day when most of us are available.” He also posted one message that contained suggestions for planning a class session and one message containing meeting minutes.

He posted seven messages related to scheduling in-class peer review sessions. These messages assigned his classmates specific peer drafts to review. He posted three messages related to protocols for naming drafts and one message suggesting a need for documentation standards to be put in place for the class.

“I think it would be helpful for the entire team if there was a standard for fonts, formatting, etc. to be used in our drafts. This way, when the design team compiles our drafts, they will have much less extraneous work to complete. If you could come up with some guidelines for the team to abide by, I can enact them by either this or the final draft.”

He posted four messages that were reminders regarding posting drafts online by the deadline given by the teachers.

Additionally, he posted one announcement to all team members regarding the project schedule, one message containing the project schedule, and two messages clarifying specific assignments.

DL2 did not post any message introducing himself in the student lounge forum.

Designated Leader 3 (Student 12) was the sole editor in this project. Even though she was officially a member of the design and editorial team, her role required her to collaborate with content developers, designers, and project managers. She was not a member of any content development team.

Designated Leader 3 (DL3) posted 49 messages in total but initiated 31 messages in the following forums: top-level content development forum (7), program-level content development forum (2), brochure content development forum (2), design and editorial forum (13), general purpose forum for all sub-teams (1), questions for teachers/clients forum (5); student lounge (1). The only forum DL3 did not post to was the project management forum. In addition to initiating messages, she also replied to messages posted by others.

Her tone and writing style was friendly but formal but she did acknowledge other people’s efforts frequently and she thanked them for their replies. She also took the initiative of reminding others of what needed to be done next. DL3’s postings were generally framed in a very positive way:

“Those areas sound right up my alley and I’d be delighted to do them ☺”

“I have included some very helpful resources which deal with language issues.”

DL3's postings showed significant evidence of leadership, partly because she held a unique role, which required her to collaborate with all other teammates, and to communicate frequently. Whilst the majority of DL3's postings were task-related, nearly all of them *also* showed evidence of defining people's roles and responsibilities and/or coordinating team activities.

“Please take a look at it and let me know what you think. Since I am speaking for all of us it is important that we all agree. Also if there is anything which you guys think I should add or perhaps exclude well I'd appreciate the feedback.”

Like most students, but unlike the other two designated leaders, DL3 posted a welcome message in the student lounge at the start of the project. She concluded the message by saying “I'm really looking forward to getting to know all of you and wish everyone the best with the various aspects of the project, I hope it goes really well for us!”.

DL3 made extensive use of the questions for teachers/clients forum to clarify issues. Her messages tended to be quite detailed and usually contained several questions. Here are two examples:

“I am just wondering where the other Irish teammates will be uploading their first drafts?

Where should I...?

Should I...?

Do I need to...?”

“Firstly is everything that ... suggested here okay with you? And secondly does revising the dates mean that...?”

Two emergent leaders: a mature student and a strong collaborator

In addition to the three designated team leaders, two other students exhibited behaviors associated with leadership; they posted a larger number of messages than their teammates (see Students 6 and 7 in Table 2) and often sought to clarify roles, tasks, and procedures both within their own sub-teams and within the larger team as a whole.

Emergent Leader 1 (EL1) was a mature student who found himself in the challenging position of being the only Irish student on a sub-team with six US students. Although some of his messages were devoted to seeking clarification regarding the project and due dates for deliverables, he also posted a message making suggestions for effective team communication and another message offering suggestions for dealing with a technological challenge related to the use of Skype.

Although EL1 did not post any messages that were solely devoted to social communication except for his

initial introduction of himself, he did attempt to establish a relaxed atmosphere by using a light tone in his messages.

For example, in a message dealing with the challenges of using Skype, he addressed his teammates by saying “Hi Boys and Girls,” and in another message he said “Hi Guys.” His informality is coupled with very practical and direct suggestions for making the collaboration a success.

Regarding a problem with ineffective team communication about the team's style sheet EL1 stated:

“Personally I am not happy with this kind of important information being passed on to one individual by word of mouth. That individual could be out sick or misinterpret the information. Important items like this should at the very least be posted on Sakai on the design team's site and the project managers' site with instructions to forward onto individual teams. Could the designers please post definitive instructions to cover fonts/headings etc and ensure this information reaches all teams?”

EL1 posted 8 task-related messages and many of them contained questions seeking clarification regarding the content of the web site. He posted 5 messages relating to group cohesion and always sought to make sure he and his teammates all had a shared understanding of the project.

Emergent Leader 2 (EL2) was a traditional college-aged student in the United States. She posted 11 task-related messages, 2 technology-related messages, and only 1 social message.

Most of EL2's task-related messages had to do with clarification of the content for her portion of the web site. She posted several messages in which she sought to make sure that there was no overlap of content and that all aspects of the content were being covered.

EL2 posted several messages to the other sub-teams regarding the content of the site and brochures. For example, she posted a message to the brochure team regarding their content:

“Hey there [student name],

I was reviewing your final copy of the brochure to make sure that modules were accurately titled (since I did much research on Module Outlines for the site), correctly numbered, etc and had a few questions regarding your draft.

In regards to the Programme Structure section:

- In semester 1, there is a discrepancy with the electives. I do NOT have a module titled "Language Engineering" or a module code, outline, or description for that name, but I DO have a module titled "Localisation Process 1" -- where'd you get your information? Who's right?

- If the "Localisation Process 1" is added under semester one, the correct title for semester 2 is "Localisation Process 2" (as referred to in the module

outlines portion of the site, current site, and according to the syllabi sent to me from the clients.

Also, it's kind of confusing that the second semester has bolded headings for "core modules" and "electives" but the first semester has long paragraphs stating similar things... perhaps this could be streamlined for continuity's sake. :]"

EL2 frequently communicated with students outside of her sub-team about issues related to the quality of the project as a whole. EL2 was generous about sharing her ideas and information. For example, she posted a blank template for meeting minutes to all team members:

"Hi guys... I posted this to my individual team, but figure if any of the other teams are interested in using it I would post it here as well. Feel free to if your own teams haven't come up with anything similar yet! :]"

She was also the first student in her team to volunteer to take meeting minutes. Throughout the course of the project, her messages reflected her desire to be a strong team player.

Impact of Leadership on Team Success

Of the four teams, three had designated team leaders as members; the two emergent team leaders were members of the program-level content development team (PLCDT), which also had a designated team leader as a member.

The PLCDT was the largest team. Despite the challenge of coordinating the schedules of seven team members, this team managed to have weekly real-time team meetings. The team established a very positive, collegial atmosphere. Although this team was composed of six US students and only one Irish student, the Irish student, who was one of the emergent leaders (EL1), was not isolated from the rest of the team. The leadership efforts of EL1 were clearly one reason why he was able to forge strong working relationships with his US teammates.

Like her Irish teammate, EL2 was also a member of the largest team. In addition to seeking to structure meetings and establish socio emotional bonds with the members of her subteam, EL2 also sought to establish strong links with all the members of the larger team. She was diligent about seeking to coordinate coverage of content with the other subteams. She also was very willing to share any information she researched with both the members of her subteam and the members of the larger team. When evaluating the work of the four subteams, the instructors found the work of the PLCDT to be more consistent than the work of other teams. Overall, their work showed strong internal consistency. Although their section of the web site was produced by seven writers, it had a unified style and tone. The high quality of their work on the site is evidenced by the grades the

members of this subteam earned both for their individual work and their group efforts (all members of the PLCDT received A or high B grades).

The brochure content development team (BCDT) had four members, and had neither a designated nor an emergent leader as a member. Three members were US students, with one Irish student. Most of the management work in this team was co-ordinated externally by PM1 and PM2. The team did hold meetings and post minutes as required by the instructors. This team posted fewer messages than any other team, and several message threads (11 of 24) had no response. The lack of leadership appears to have impacted on the group's work in two ways:

- The brochures produced were not internally consistent. Each had different sections and content, though the templates were consistent.
- The brochure content development team members' later and final drafts required significant editing by the clients, indicating a weaker management structure than the other teams.

The design and editorial team (DET), with four members, had one designated leader and no emergent leader. The designated leader was editor for the whole project. The other team members worked on designing the interface and building the site's technological framework.

Although the team included an editor, who was a designated leader, the members of this team appear to have worked independently. Most message threads in the team forum (22 of 35) had no response. Much of the management work in this team was co-ordinated externally by PM1 and PM2, while the editor worked with all teams to help them produce high quality drafts.

Because they were not involved in producing content, there was not as much opportunity for a leader to emerge among the three designers in this team. The designers spent some time determining how best to structure the site and then worked independently to produce their individual parts of the whole.

The top-level content development team (TLCDT), with four members, had one designated leader but no emergent leader. Two members of the TLCDT were Irish; the other two were from the US.

Even though the designated leader (DL1) posted a high number of task-related messages and attempted to promote group cohesion by giving positive affirmation to her teammates, only 4 of her 38 postings actually related to group cohesion. Also, even though there were 25 threads in the team forum, the majority of these threads were started by designated leaders and 12 of the threads did not receive any replies.

The lack of cohesion in this team was evident in their performance as a group (this team received a low grade for the initial group proposal) and there were also some

problems with overlap; on at least one occasion, two team members were simultaneously working on the same section. Even though the overall performance of the team improved as the project progressed, it is not certain whether this was due to improved leadership or improved individual effort.

Even though all deliverables in the project were related, the amount of communication among designated leaders was very limited. We created a discussion forum to facilitate collaboration among the project managers. However, only seven messages were posted to this forum, and two of those were not from designated leaders.

Challenges and limitations

- There were twice as many UCF as Irish students, which made the job of organizing students into teams more difficult.
- We had to ensure that the project specification matched the objectives of two quite different courses.
- The two UL faculty members had to deal with the teams as a) clients, and b) teachers, which made the project very time-consuming. We had to be very specific about our requirements for the redesigned site, as well as the requirements for the project as a whole. Nonetheless, we found the project to be very rewarding, because the teams produced an aesthetically appealing and useful web site.
- Although we had initially planned to track the project entirely through Sulis, some personal messages sent through Sulis did not reach us (due to a technical glitch), and as a result, we had to ask students to correspond with us by email. Some students then started using email for student-to-student communications also, so we were unable to analyze those messages.

Conclusions

- The three designated team leaders posted more messages than any of the other team members. Whilst the majority of these messages were task-related, they also posted a significant number of messages relating to defining/assigning team members' responsibilities and coordinating team activities. As identified in the literature review, these are the typical duties of team leaders.
- Two additional leaders emerged from this project and both posted significantly more messages than the other students (with the exception of the three designated leaders). Both students posted several task-related messages and one of them also posted several messages relating to group cohesion.
- Online communication among the designated leaders was very limited, possibly because both project

managers were located in Florida and could communicate face to face, while the editorial role, based in Limerick, was unique. This lack of explicit managerial collaboration did not appear to adversely affect the quality of the final work, though it may have affected overall group cohesion.

- Several students mentioned in the final videoconference that there should have been an Irish and a US project manager. For future projects, even if student numbers are unbalanced, we intend to allocate a project manager in each location.

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