Pilot Project: Participation in and Characteristics of Team Conversations in Online Chat and Face-to-Face (f2f) Environments

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Problem of Practice

- In 2013, teams are essentially "hybrid" or "virtual," collaborating at least sometimes in electronic settings, but much more is known about group dynamics in f2f settings.
- In f2f team conversations, contributions are often skewed, with a few members speaking a lot and others speaking very little.
  - The "silenced" members are often minorities in the class– female students, non-native English speakers.
  - The patterns of privilege that silence speakers might be disrupted by characteristics of online chat.

Characteristics of Online Chat

- Less synchronous: There is time to pause, collect thoughts, and then type. Multiple people can type at once (and so respond to the same thought). There is less jockeying for conversational position. (De Wever et al., 2006).
- Text-based: The textual nature of chat may make it easier for non-native English speakers to participate, and it allows for a permanence to the conversation that allows the team and instructors to look back at the conversation (Gunawardena et al., 2001; Morse, 2004).
- Lower social presence: The lowered social cues may make it easier for shy students to contribute and for students to provide constructive criticism of others' ideas (McLeod et al, 1997; Zhao, 1998).

General Method and Description of Context

- Multiple sections of "Introduction to Engineering" Fall 2012-Fall 2013. All sections are design-build-test.
- Students are working in teams of four or five (with one exception, a team of six). Teams are assigned by instructors.
- Initial team meeting, to which students bring individual design ideas and are instructed to leave meeting with a shared plan to begin building. (Transcripts of chat are saved [n=98]; f2f teams are recorded and conversations transcribed [n=37])
- Students completed a survey about their perceptions of the experience (n=164; 98 of these participants are in the chat condition)

Research Questions

Does conversation context affect the participation of sometimes silenced group members, either in reality (measured via transcripts) or perception (measured via survey)?

How are team conversations held in chat and f2f environments similar or different with regards to rhetorical moves, objects of discussion, politeness, level of critique and agreement, and participation?
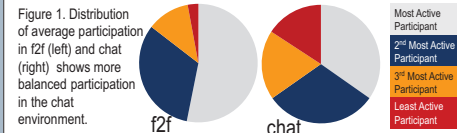
Analysis of Transcripts

- Chat transcripts and transcripts of f2f conversations were broken into t-units (thematic unit: independent clause + all of its dependent clauses). Because of the informal, chat nature of the transcripts, some utterances were shorter than a complete independent clause.
- Each participant's total participation (defined as number of t-units) and also relative contribution (defined as number of t-units divided by team's average number of t-units) was calculated.
- Each t-unit was coded according to rhetorical purpose (see Table 1), object of discussion (design context, design idea evaluation, other), complexity (low, high) and by speaker characteristics (gender, native language). Coding was done by the primary investigator, but a subset will be analyzed by a second coder as well, so that inter-rater reliability can be reported.

Rhetorical purpose	Example
Information seeking	Is that pointing inwards or forwards?
Information providing	We should build some wicked cone shape on front where the camera would go, that would provide hydrodynamics or something
Topic directing	We should probably wait until everyone is here, but then we should discuss thruster placement.
Express agreement	I like Mike's idea of thruster placement
Express disagreement	No, just the front [should be cone-shaped], the rest should be a rect. Prism
Politeness/convention	Hi Thomas.
Other	Your CAD drawing makes me jealous.

Table 1. Coding categories (rhetorical purpose)

Results: Participation

- There are more t-units produced in the chat conversations, but that difference goes away when "politeness/convention" and "expressing agreement" codes are excluded from analysis. I believe that some of these contributions happen nonverbally in the f2f conversation.
- Conversations in online chat are much more "democratic," with more balanced participation among group members. See Figure 1 for the relative distribution of t-units produced by the participants.

Figure 1. Distribution of average participation in f2f (left) and chat (right) shows more balanced participation in the chat environment.

Legend: Most Active Participant; 2nd Most Active Participant; 3rd Most Active Participant; Least Active Participant

- Female students participate significantly more in the chat environment (p<.05), though they report similar participation in the two conditions on the surveys.
- There was no significant difference between non-native English speaking students in terms of real or perceived participation. However, the low number of participants in this condition (n=12) makes this finding difficult to interpret.

Results: Conversation Characteristics

- Most of the rhetorical moves are present in roughly equal distributions in the f2f and online chats. Significant exceptions (all p<.05):
  - "Information providing" moves are more common in the chats.
  - "Politeness/convention" moves are more common in the chats, perhaps because of the greetings and signoffs that are not part of the f2f transcripts.
  - Simple "expressing agreement" moves are more common in the chats, perhaps because nods that happen silently in the f2f meeting are verbalized in the chat.
- There was no significant difference in terms of the objects of discussion.
- There was a non-significant trend toward more complex thoughts in the online chat (p=.07).

Discussion and Conclusions

- In the f2f meetings, it is common for one or a few team members to speak a lot and for one or a few members to speak very little (in fact, in 4 of the 9 f2f transcripts, one team member did not speak at all). This imbalance is ameliorated in the online chats. Of the 22 transcriptions of teams meeting in the chat space, none of them include a totally silent team member.
- The online space seems to increase participation among female students. It is expected that a similar result might be found among other groups, with a larger sample.
- The online chat had more "information providing" turns than the f2f meeting, which may reflect the ability of speakers to consult additional information and then return to the conversation. Instances of students posting links and quoting from course notes and handouts were common in the chat transcripts.
- The trend toward more complex thoughts in the online chats might also suggest that the relaxed synchronicity requirements of the chat allowed for more reflection, for the formulation and communication of more complex ideas.
- Many students report disliking the chat environment. A further project could investigate whether video-conferencing technologies might increase student satisfaction.

Lessons Learned

- The coding scheme has been through multiple iterations and is now in a form that the researcher believes is useful.
- Any future implementations of the survey will be online (via Qualtrics) and with very few open-ended questions. Almost none of my participants answered any of the open-ended questions.
- I will consider re-collecting face-to-face data, video-taping sessions and including non-verbal information.
- Students dislike the chat environment for the conversation.

Acknowledgments