What do students talk about, and how, during team design negotiations held via synchronous chat and face-to-face?

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First year “Introduction to Engineering” (ENGR 100):
Team-based, problem-based design and communication course

Teams of 4-5 students assigned to meet via synchronous chat (held in Google Docs) or face-to-face (f2f) (audio-recorded) for single 45-minute initial design conversation.

The conversations studied are both “authentic” (part of the actual process in the course) and “high stakes” (the idea negotiated at this meeting affects student grades and workload in remainder of course).

The co-instructor/researcher was salient in the conversations (as a lurker in synchronous chat groups and as a microphone in face-to-face groups).

Content analysis: Transcripts unitized and coded for what was discussed and how

<table>
<thead>
<tr>
<th>WHAT (Obj. of discussion):</th>
<th>HOW (Rhetorical function):</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Design itself</td>
<td>• Info seeking</td>
</tr>
<tr>
<td>• Problem space</td>
<td>• Info providing (no rationale)</td>
</tr>
<tr>
<td>• Other, related</td>
<td>• Info providing (with rationale)</td>
</tr>
<tr>
<td>• Other, not related</td>
<td>• Topic directing</td>
</tr>
</tbody>
</table>

Inter-rater reliability

15% of sample coded by 2 raters

Kappa, WHAT = 0.913
Kappa, HOW = 0.924

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(Thank you!)

In this study, which compared communication in groups meeting via synchronous chat and face-to-face:

Groups meeting f2f had lower levels of expressed disagreement. It is likely that the amount of disagreement was not different between the groups, but that students f2f did not feel free to express it.

Groups meeting via synchronous chat were more likely to provide explicit rationales, but the way they did so (often providing a link in the chat) is likely less pedagogically useful.

Two goals of the communication in team-based, problem-based learning, from the education literature: DISAGREEMENT and EXPlication

Disagreement: Teams with moderate levels of disagreement produce more creative solutions, earn better scores on projects (Cress & Kimmerle, 2008).

Rationale: For each team, codes “with rationale” were summed and divided by sum of all codes that could conceivably include rationale (all “with rationale” AND all “no rationale” codes). A T-test shows a significant difference in the two communication modalities:

Table 1. Disagreement significantly more likely to be expressed in the chat condition.

<table>
<thead>
<tr>
<th></th>
<th>Chat</th>
<th>F2F</th>
<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD) Disagreement</td>
<td>0.064(0.0034)</td>
<td>0.039(0.017)</td>
<td>3.57</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 2. Explicit rationales significantly more likely to be expressed in the chat condition.

<table>
<thead>
<tr>
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<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD) rationale Provision</td>
<td>0.365(0.070)</td>
<td>0.251(0.063)</td>
<td>2.70</td>
<td>0.009</td>
</tr>
</tbody>
</table>

This study shows a significant difference in the two communication modalities:


