The Impact of Mobile Technology on Student Attitudes, Engagement, and Learning

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Students express overall satisfaction with small groups in comparison to other discussion formats. (Hamman, Pollock, and Wilson, 69)

Small groups were more likely to stimulate interest and help them engage the material. (Hamman, Pollock, and Wilson, 72)

Hamman, Kerstin, Philip H. Pollock, and Bruce M. Wilson. Assessing Student Perceptions of the Benefits of Discussions in Small Groups, Large-Class, and Online Learning Contexts. *College Teaching*, 60: 65-75, 2012.

A 2013 review of research on computer-assisted collaborative learning recommended many more studies should be conducted in this area, specifically using current mobile technology and collaborative learning. (Hsu and Ching, 112)

Hsu, Yu-Chang and Yu-Hui Ching. Mobile Computer-Supported Collaborative Learning: A Review of Experimental Research. *British Journal of Educational Technology.* 44(5):111-114, 2013.

Research Questions

1. In what ways does HeadsUp facilitate *student engagement* during small groups?

2. In what ways does HeadsUp facilitate *critical thinking* during small groups?

An education app designed to facilitate collaborative learning by:

assigning students to random small groups
assigning random roles to students within groups
disseminating the discussion prompt

Student Engagement

Critical Thinking

HeadsUp Technology

Cooperative Learning

Methodology

Research **design, IRB approval**

Small group **discussion prompt** created

13 Groups 52 students	13 Groups 55 students	13 Groups 52 students
Common Practice	Best Practice	HeadsUp
Discussion prompt read	Discussion prompt read	Discussion prompt read
no written prompt given	written prompt given as handout	written prompt given via HeadsUp
No roles assigned	Randomly assigned roles; Leader, Author/Reporter, Time-keeper, Referee	Randomly assigned roles; Leader, Author/Reporter, Time-keeper, Referee
Students groups created by self-selection	Student groups created by self-selection	Student groups assigned randomly via HeadsUp

Order of session type was determined by random drawing

Methodology

159 Students

39 small groups (of 3-5 students)

11 classroom sessions

3 months (4 Dec. 2013 to 6 Mar. 2014)

First-year students enrolled in Core Curriculum courses: either "Cornerstone" or "Identity and Community"

Methodology

Each session followed a strict order

5 minutes – **students arrive** into LRL

3 minutes – **Introduce self** and what we will do

1 minute – **Sign Consent to Participate Form**

5 minutes – **Download HeadsUp** (if applicable)

1 minute - **Read Prompt**

15 minutes – Divide into **Small Groups**
(During this time enter student emails for eval. form)

12 minutes – Hear 3-minute **Reports** from each table

2 minutes – **students email written responses** to me

5 minutes – Attitudes and Experiences **Evaluation**

Student Engagement

Video
Observations

Critical Thinking

Written
Product

HeadsUp Technology

Student
Evaluations

Cooperative Learning

CP, BP, HU

HeadsUp Technology

Student Evaluations

	Common Practice	Best Practice	Heads Up
I had **good interactions** with other **students** in the cooperative learning activity.	4.49	4.71	4.48
I had **good interactions** with the **instructor** in the ... activity.	4.56	4.49	4.49
I **like** cooperative learning group activities.	4.27	4.13	4.09
HeadsUp helped me be **more engaged** in the cooperative learning group activity.	-	-	4.05
HeadsUp facilitated **group discussion.**	-	-	4.14
HeadsUp increased my **interactions** with others.	-	-	3.89
I liked using **HeadsUp**.	-	-	3.80

Based on a Likert-type scale from 1 (strongly disagree) to 5 (strongly agree).

Student Engagement

Video Observations

OVO Logger™

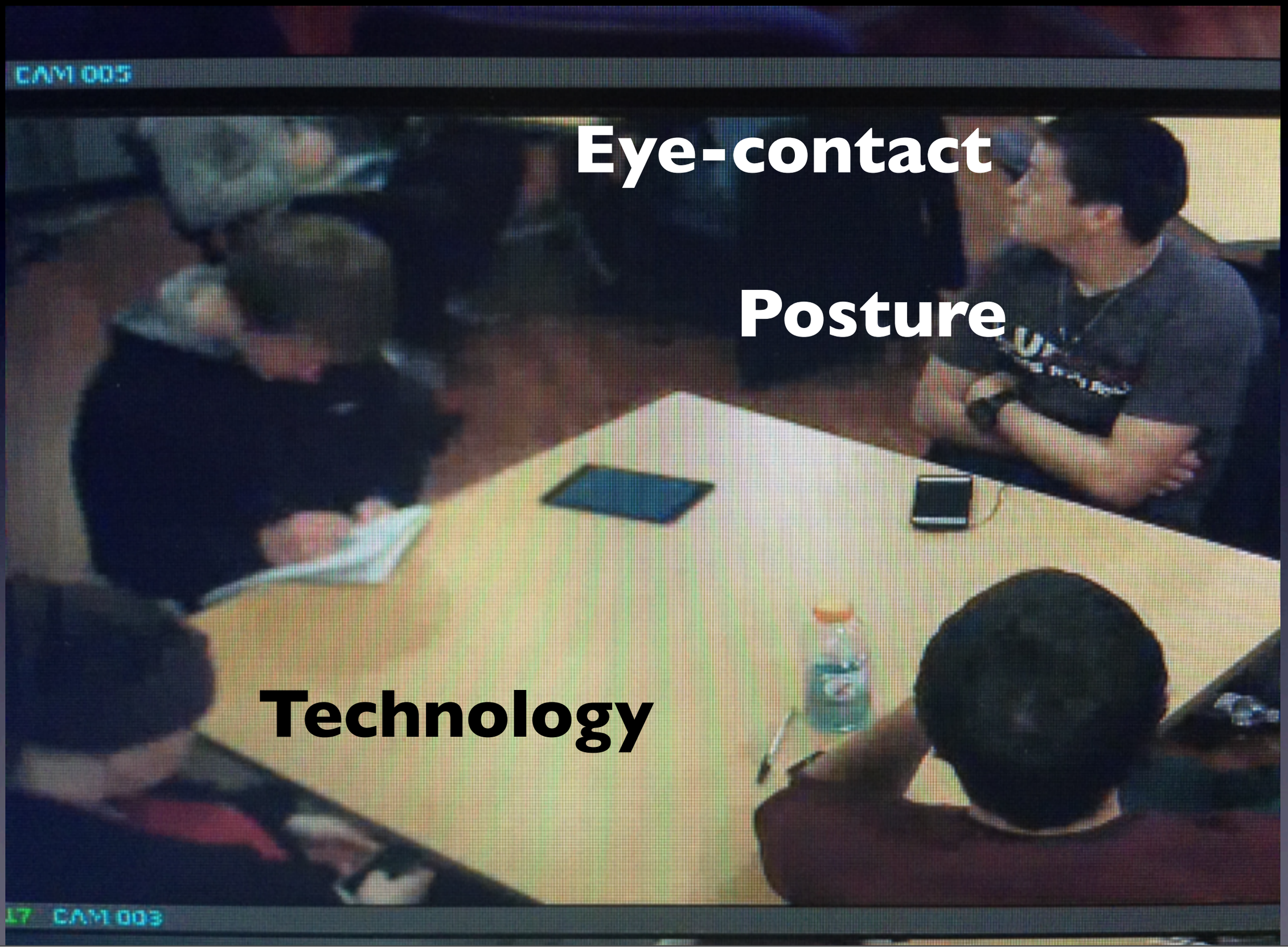
OVO Studios Usability Labs, Software, and Services


OVO Logger
OVO Studios Usability Labs, Software, and Services

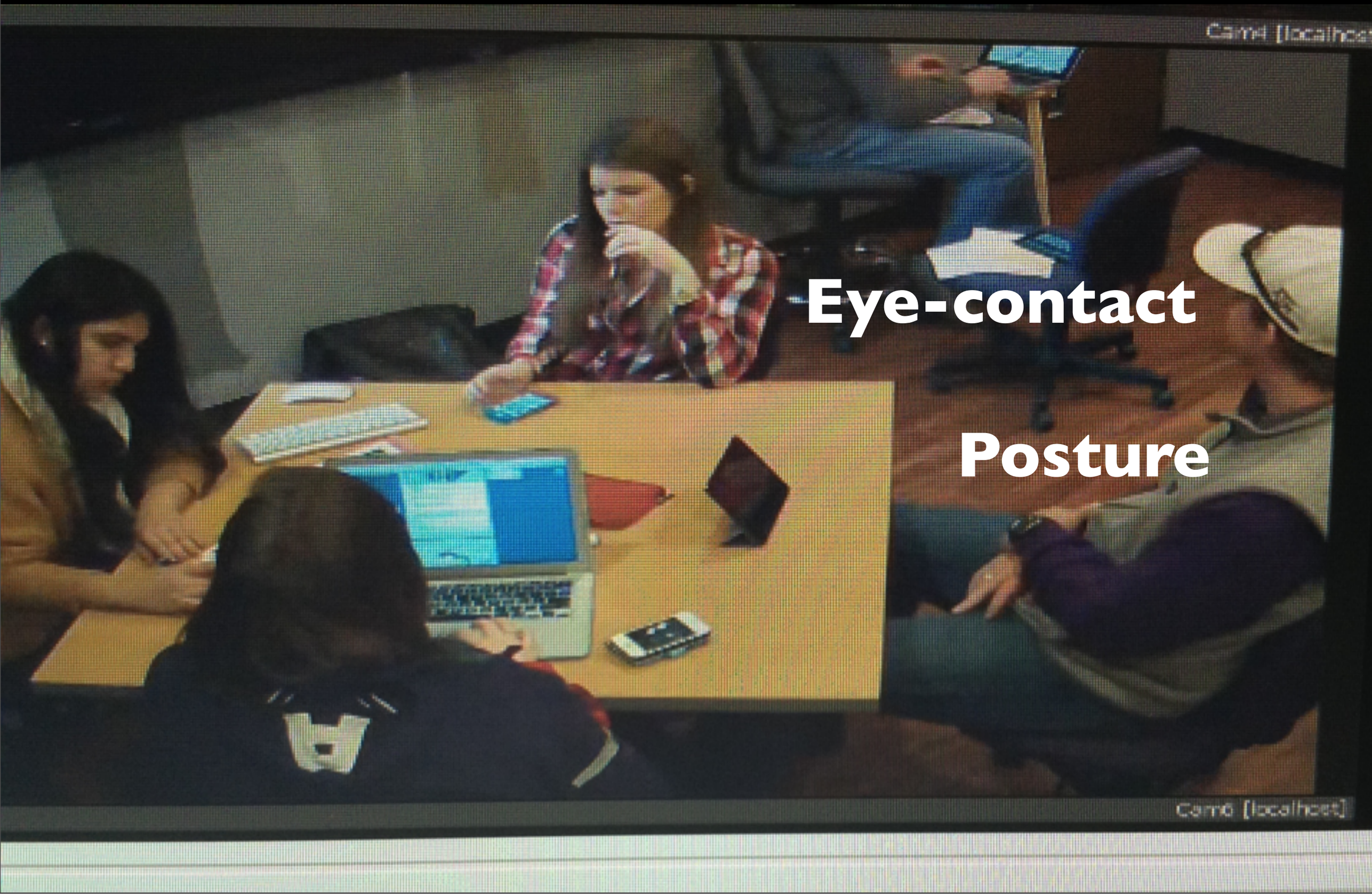
	Engaged	Disengaged
Posture	Leaning forward; facing toward group; awake	Leaning back; facing away from group; asleep
Gestures	Moving hands to communicate	Hands not used to communicate
Speech	Contributing verbally to the conversation	Remaining silent
Eye Contact	Looking at the person speaking; appears to be listening	Looking away from person speaking; appears not to be listening
Technology Use	Using technology for the purpose of the group; note-taking	Texting, surfing the web, or using technology in a way unrelated to group work.
Emotional Response	Smiling, laughing, anger, or in some way showing emotional investment	Disengaged emotionally

Students Consented to Video Recording

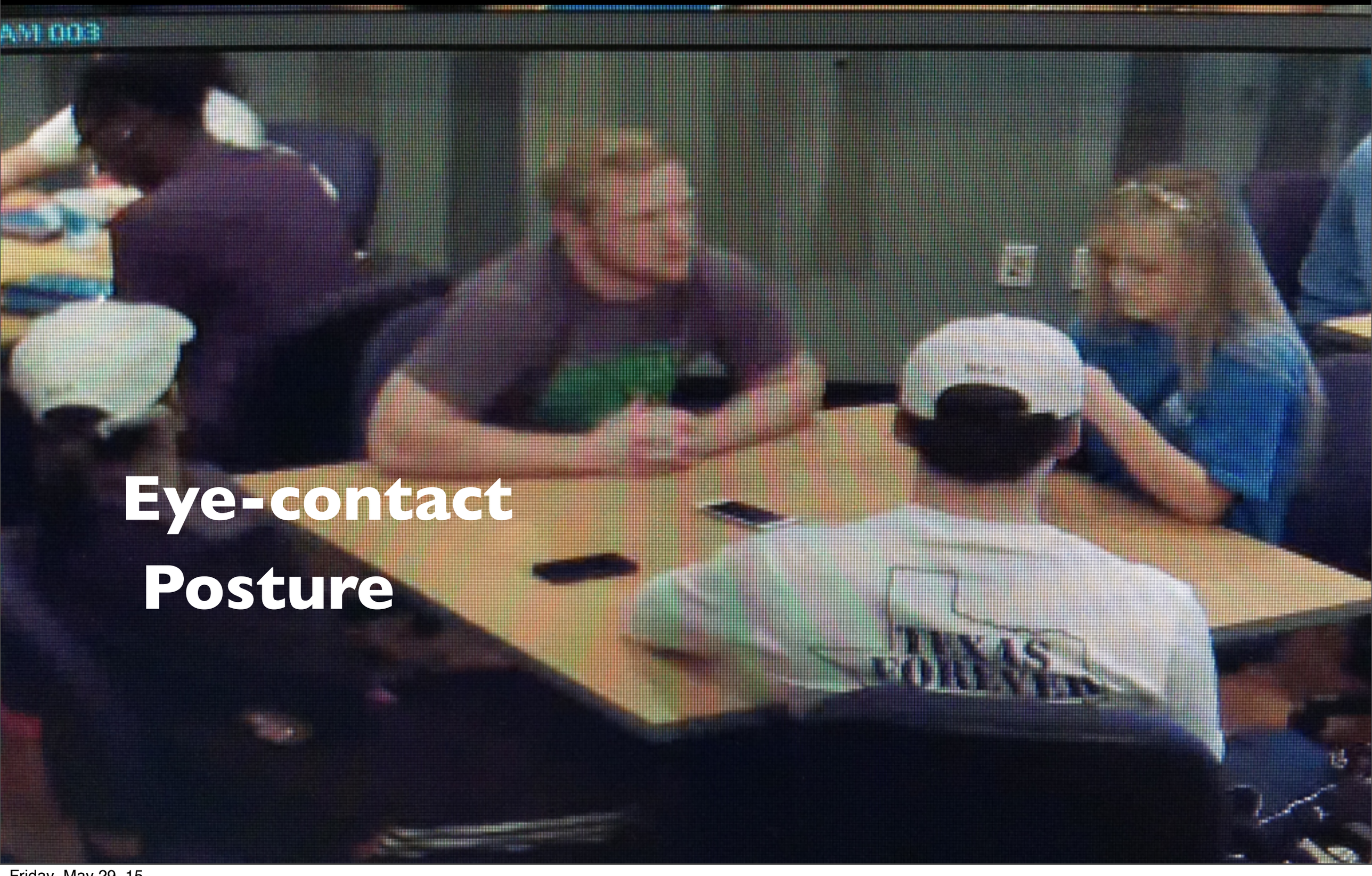
Disengaged:



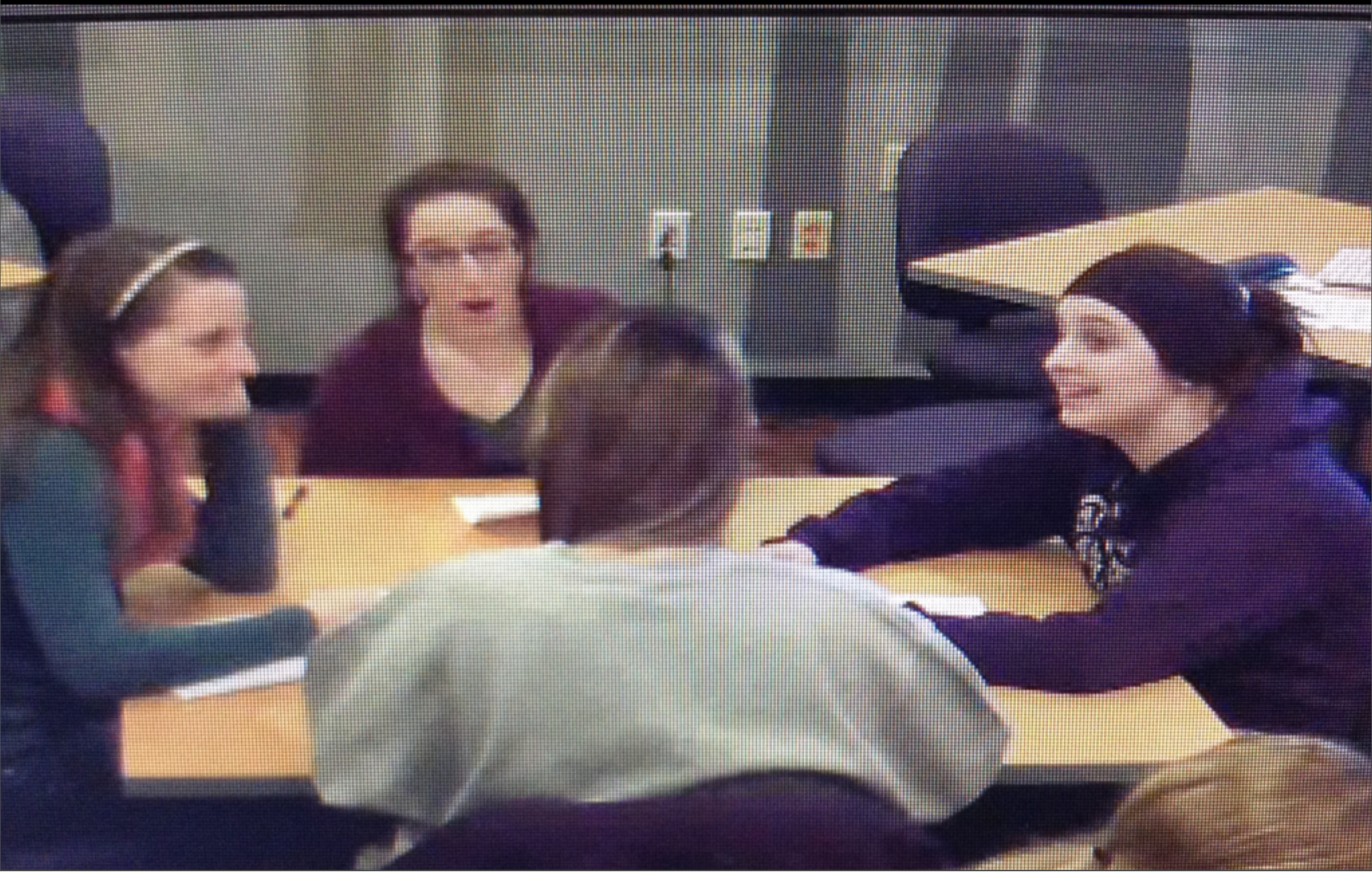
Disengaged:



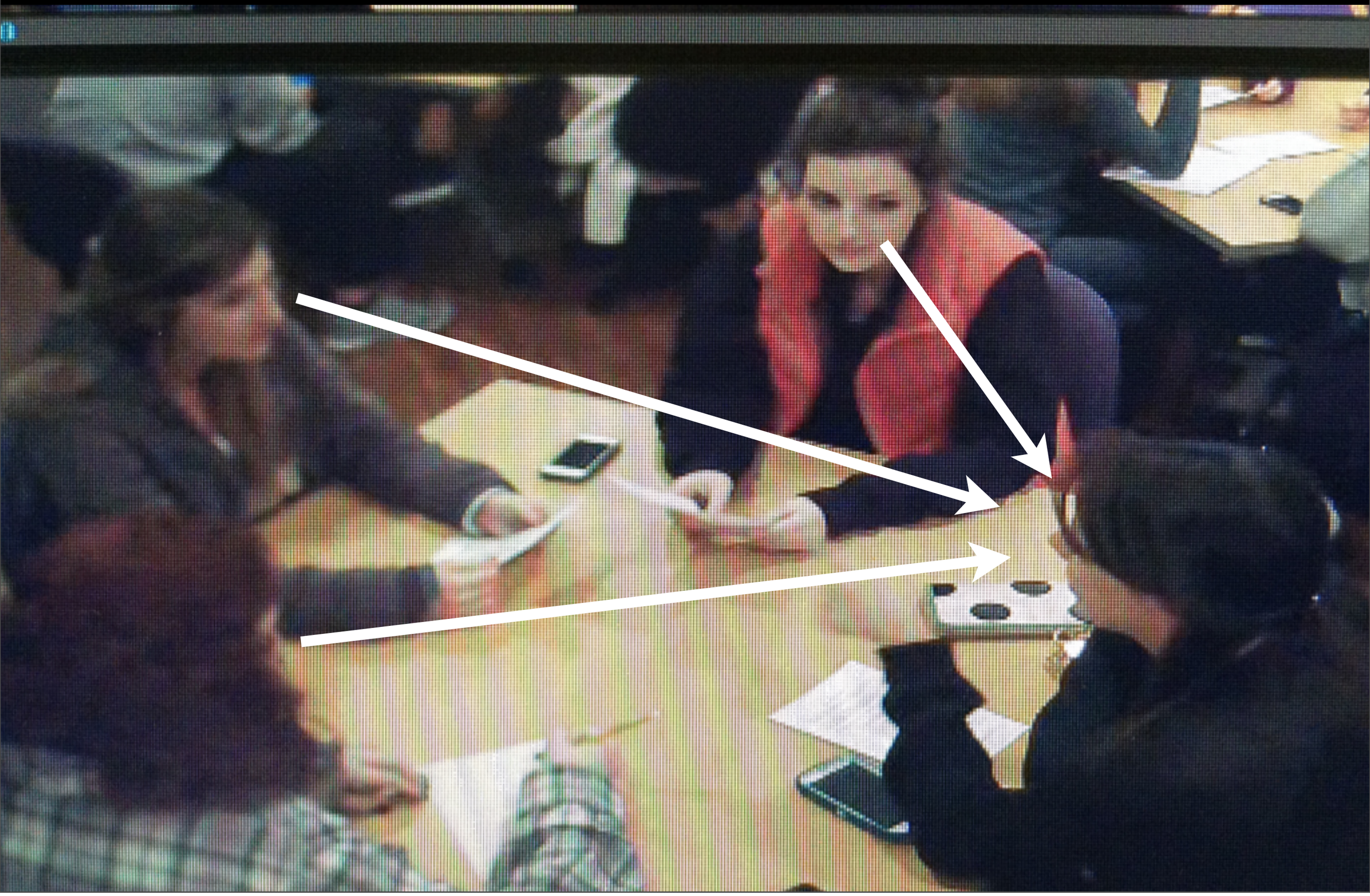
Disengaged:



Engaged: Emotional Response



Engaged: Eye-Contact

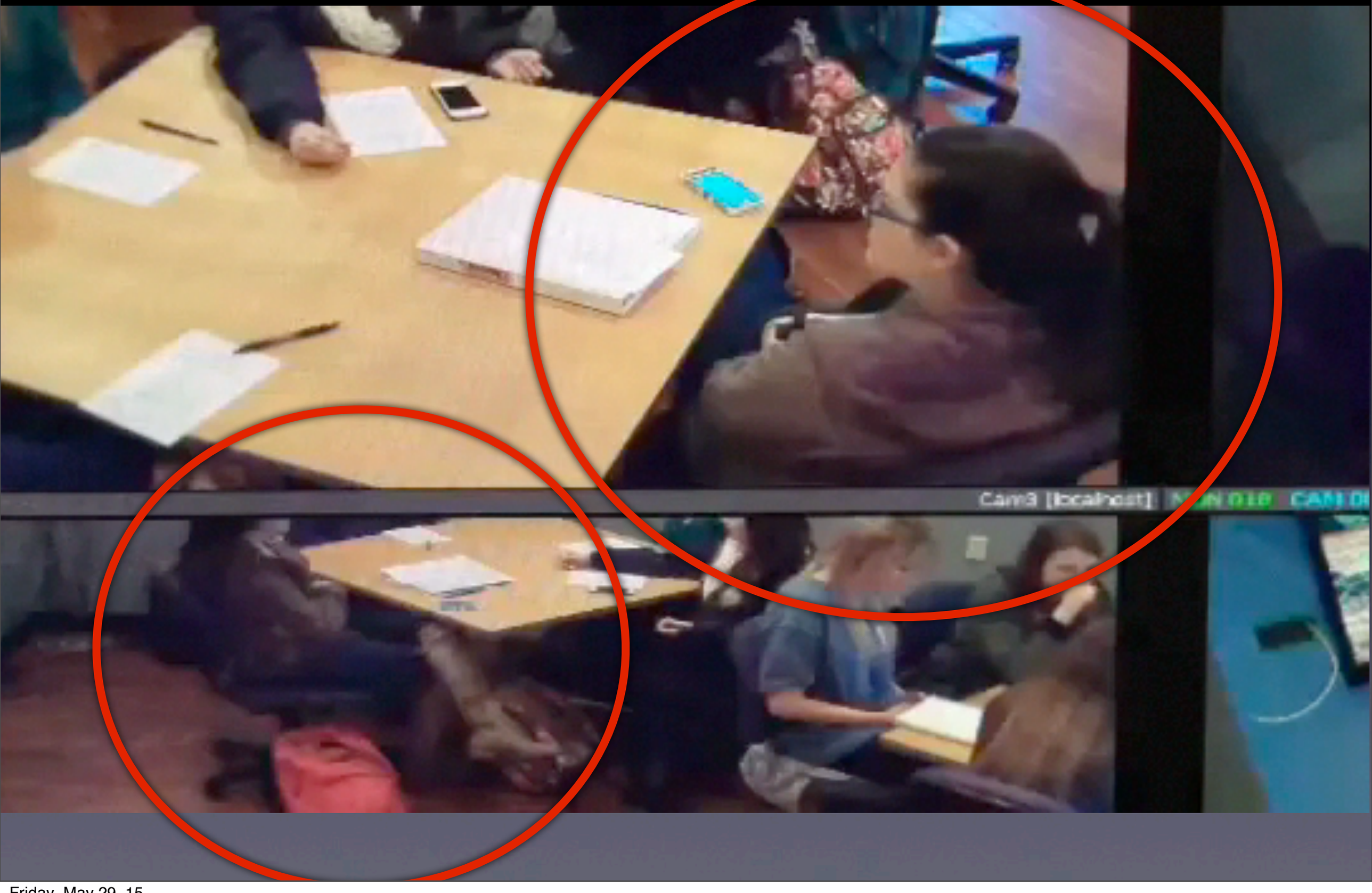


Emotional (& physical) response

Disengaged:

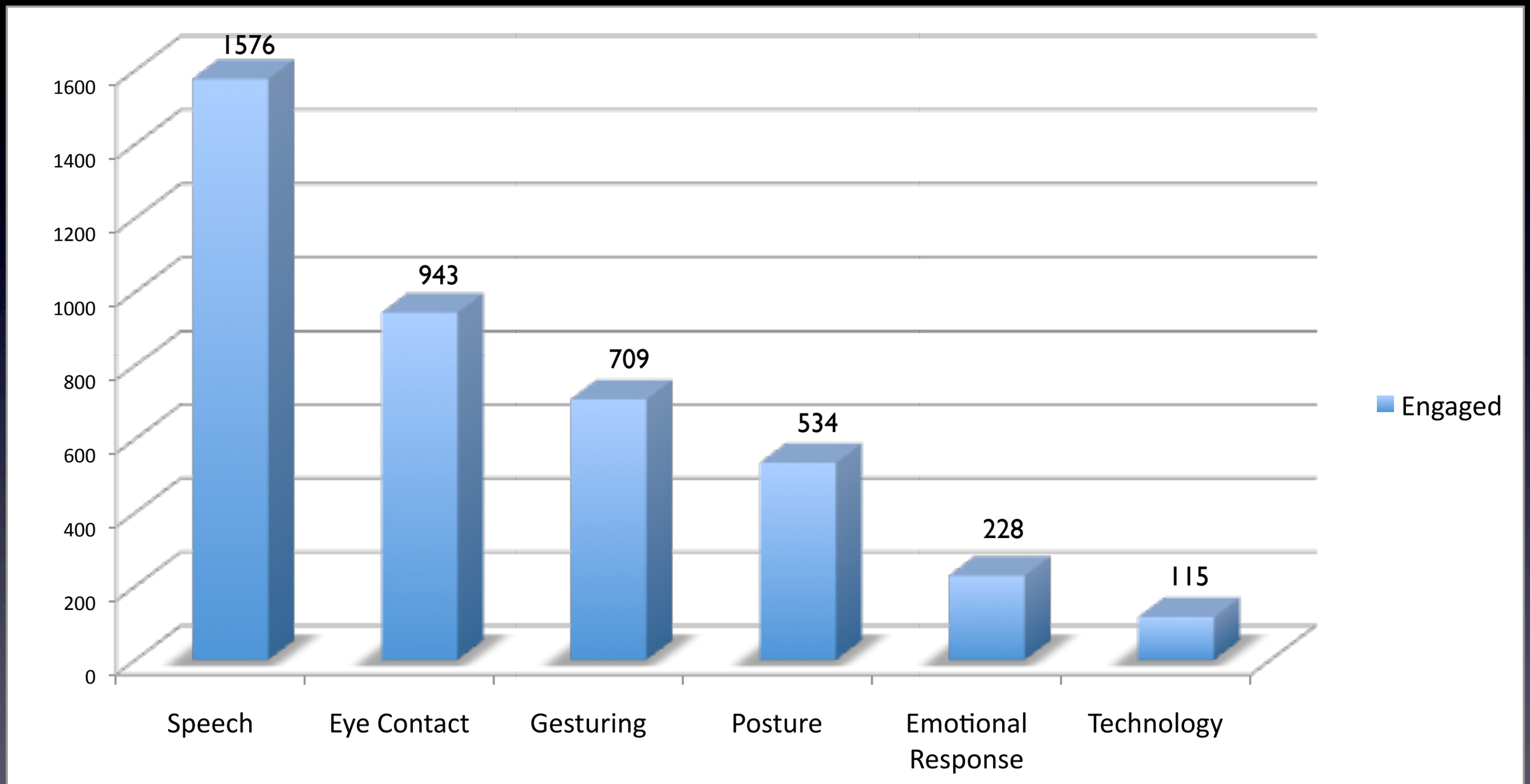
All Uses of Technology are Not Equal

From disengaged to engaged posture



Engaged Observations

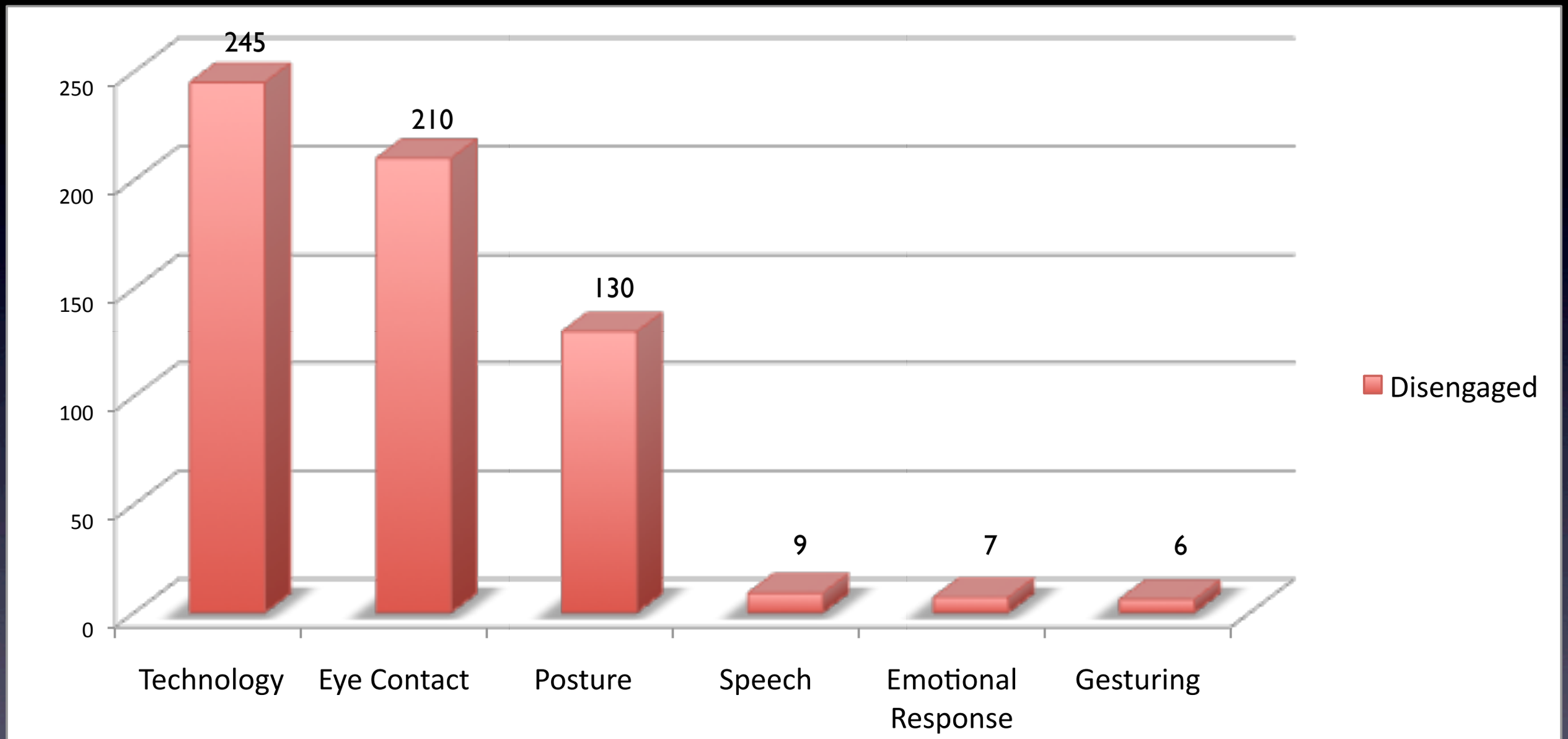
	CP	BP	HU	TOTAL
Speech	566	586	424	1576
Eye Contact	353	321	269	943
Gesturing	269	274	166	709
Posture	184	185	165	534
Emotional Resp.	68	92	68	228
Technology	11	21	83	115
	1451	1479	1175	4105



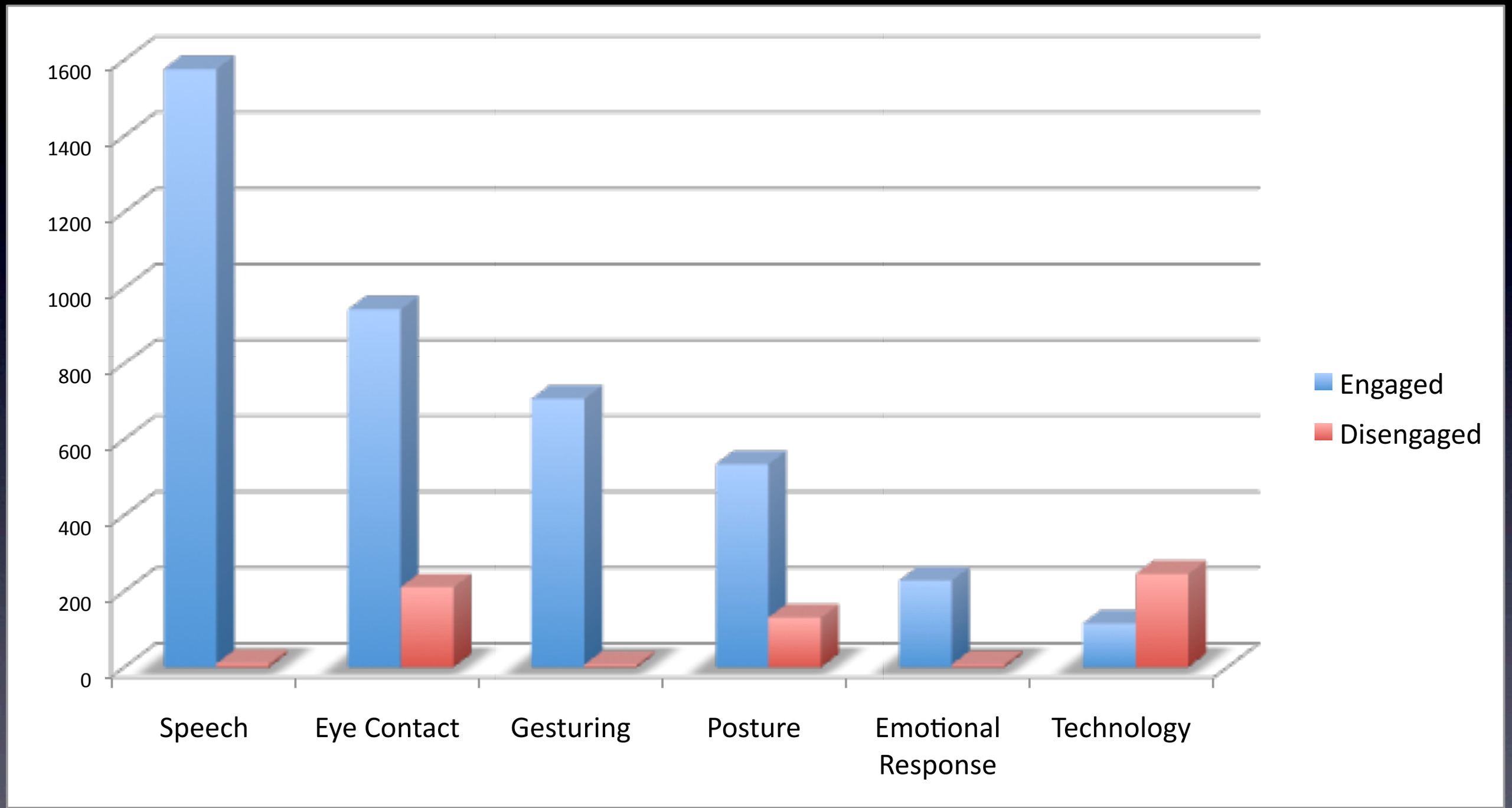
159 Students in 39 small groups

Disengaged Observations

	CP	BP	HU	TOTAL
Technology	15	23	207	245
Eye Contact	80	70	60	210
Posture	40	38	52	130
Speech	1	7	1	9
Emotional Resp.	0	3	4	7
Gesturing	3	3	0	6
	139	144	324	607



159 Students in 39 small groups


1600
1400
1200
1000
800
600
400
200
0
Speech
Eye Contact
Gesturing
Posture
Emotional Response
Technology
Engaged
Disengaged

Critical Thinking

Written Product

Evaluating Critical Thinking

39 paragraphs evaluated by 3 blind reviewers

			N.A.	Poor	Fair	Good	Excel.		JS	JN	HH
Relevant Issues	Adequacy	Major Factors Ignored	1	2	3	4	5	Major Factors Considered			
	Pertinence	Unclear how issues affect analysis and/or recommendation	1	2	3	4	5	Very clear how issues affect analysis and recommendation			
Analysis	Objectivity	Opinions and preferences expressed	1	2	3	4	5	Well-matched to problem			
	Reasoning	Unclear evaluation criteria	1	2	3	4	5	Complete Solution			
	Focus	None / on irrelevant issues	1	2	3	4	5	Alternatives distinct			
	Information	Not used	1	2	3	4	5	All alternatives legitimate			
	Tools	Not / inappropriately employed	1	2	3	4	5	Pros & Cons factually presented			
Recommendation	Decision	Straddling the fence	1	2	3	4	5	Clear criteria employed			
	Logic	No reason provided	1	2	3	4	5	On relevant issues			

We think that the legal driving age should stay the same. It has worked so far and we think that people would still drive at that age anyways even if the age was change. Its also more convient because 16 year olds are just entering high school and it would be nice for them to be able to drive. Also people say that teenagers are at the point in their lives when they take the most risks so if the legal driving age was changed they would take the risk and drive illegally so why not keep it the same age and they can drive legally. • How will they get to work • Might create an older class of unexperience.

TYPE OF SMALL GROUP:	Common Practice	Best Practice	Heads Up
Average paragraph response score	29.2	27.8	26.3

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Average paragraph response score	29.2	27.8	26.3

TOOL USED TO CREATE PARAGRAPH:	iDevice	Written	Computer
Average paragraph response score	22.9	27.7	31.5

Observations & Conclusions