Chapter 3: Social Cognition
1. In a group includes students with different levels of knowledge:
   - The lower students will learn from the explanations provided the better students
   - The better students will learn from explaining the task to the lower students
   - None of them will learn well because the difference of levels
   - Both will learn to work in heterogeneous teams, which is socially important

2. If a group includes students having opposite opinions or conflicting knowledge, will collaborative learning be effective?
   - No, because there will be a negative team spirit
   - No, because the student with incorrect knowledge might convince the one who had the correct knowledge
   - Yes, because this will force them to argue with each other and to elicit their knowledge
   - Yes, because they will learn to collaborate in conflict situations

3. When forming groups of students, what is the best way of combining men and women:
   - Separating them because their differences might prevent them to focus on knowledge
   - Mixing them because differences of collaboration style might increase the group effectiveness
   - Mixing them because they will have to collaborate in mixed groups in their professional life

4. What is the primary role of computers in collaborative learning?
   - Communication tools (chat, forum, ...) enable teamwork at distance
   - Collaboration software can be designed to influence collaboration
   - Internet provides students with the knowledge they don't have in the team
   - It is important that students learn to collaborate in teams distributed worldwide
1. In a group includes students with different levels of knowledge:
   + 10  □  The lower students will learn from the explanations provided the better students
   - 10  □  The better students will learn from explaining the task to the lower students
   + 5   □  None of them will learn well because the difference of levels
   - 2   □  Both will learn to work in heterogeneous teams, which is socially important

2. If a group includes students having opposite opinions or conflicting knowledge, will collaboration be effective?
   + 5   □  No, because there will be a negative team spirit
   + 10  □  No, because the student with incorrect knowledge might convince the one with correct knowledge
   - 10  □  Yes, because this will force them to argue with each other and to elicit their knowledge
   - 5   □  Yes, because they will learn to collaborate in conflict situations

3. When forming groups of students, what is the best way of combining men and women:
   + 8    □  Separating them because their differences might prevent them to focus on knowledge
   - 10  □  Mixing them because differences of collaboration style might increase the group's effectiveness
   - 2   □  Mixing them because they will have to collaborate in mixed groups in their professional life

4. What is the primary role of computers in collaborative learning?
   + 3    □  Communication tools (chat, forum, …) enable teamwork at distance
   - 7   □  Collaboration software can be designed to influence collaboration
   + 10  □  Internet provides students with the knowledge they don't have in the team
   + 2   □  It is important that students learn to collaborate in teams distributed worldwide
1. In a group includes students with different levels of knowledge:
   - +10 ☐ The lower students will learn from the explanations provided the better students
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2. If a group includes students having opposite opinions or conflicting knowledge, will collaboration be effective?
   - +5  ☐ No, because there will be a negative team spirit
   - +10 ☐ No, because the student with incorrect knowledge might convince the one with correct knowledge
   - -5  ☐ Yes, because this will force them to argue with each other and to elicit their knowledge
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   - +10 ☐ Separating them because their differences might prevent them to focus on knowledge
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4. What is the primary role of computers in collaborative learning?
   - +7  ☐ Communication tools (chat, forum,...) enable teamwork at distance
   - +2  ☐ Collaboration software can be designed to influence collaboration
   - +10 ☐ Internet provides students with the knowledge they don't have in the team
   - -10 ☐ It is important that students learn to collaborate in teams distributed worldwide
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1 + 1 > 2

Is learning in teams more effective than learning alone?
Question 1: Is Collaborative Learning Effective? 

<table>
<thead>
<tr>
<th></th>
<th>Learning Gains</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meta-analyses: collaborative versus individual</td>
<td>&gt; = &lt;</td>
</tr>
<tr>
<td>Slavin, 1983.</td>
<td>26 14 1</td>
</tr>
<tr>
<td>Johnson &amp; Johnson, 1989</td>
<td>829 645 109</td>
</tr>
</tbody>
</table>

A decision maker could conclude that the probability that team learning is effective is high enough to use it. A scientist would instead conclude that team learning is not effective per se, but depends on the conditions... see next slide
Pitfalls in Teamwork

• ‘GroupThink’: pressure to consensus leads to suboptimal answers

• In education, as soon as they agree, learners return the solution to the teacher without checking if it is the best one

https://www.youtube.com/watch?v=glUUmsBb_58
Pitfalls in Teamwork

• ‘GroupThink’: as soon as they agree, learners return the solution to the teacher without checking if it is the optimal solution

• **Free-rider** / Social Loafing: some teams members let the others do the work

• **Domination**: some team members dominate verbal interactions; contributions from some members are rejected or not taken into consideration

• Emotional (vs epistemic) **conflict**
Question 2: **When** is collaborative learning effective?

**Factors:**

- **Group composition:** number, level, gender, age, ...
- **Task features:** verbalizable, open, ...
- **Medium:** face-to-face, synchro/not, text/audio/video,...
- **Context:** school/work

The effects of collaborative depends upon so many variables (plus their interaction effects) that it is impossible to predict that a given teamwork in a specific context will be effective.
Question 3: Which interactions make collaborative learning effective?

1. Elaborated explanations
2. Conflict resolution, Argumentation / Négociation
3. Mutual Regulation

Collaborative learning occurs when team members engage into the ‘productive interactions’ listed above. These interactions are summarized as “the effort” that team members engaged to reach and maintain a shared understanding of the task.
Collaborative learning occurs when team members engage into **rich verbal interactions**.

These interactions are summarized as “the effort” that team members engaged to reach and maintain a **shared understanding** of the task.
HERE
Question 4: Which design increases the probability that teams produce rich verbal interactions (that make collaborative learning effective)?
Conditions of coll. learning → Interactions → Effects

(proactive) → (reactive)

STRUCTURE → (self-) REGULATE
Self-regulation Tools

PROP
The balance of talk and tune

Tuning
Talking

Mean Waiting
Lane 1
Lane 2
Lane 3
Lane 4

28.8
Mean Waiting
Lane 1
Lane 2
Lane 3
Lane 4

P. Jermann
Example of domination in teamwork
Self-regulation Tools

Reflect Table

K. Bachour, F. Kaplan, W. Hokenmeier
“When I noticed that my LEDs weren’t lit indicating my inactivity, I felt frustrated.”

“I sometimes refrained from speaking to avoid having a lot more lights than the others. This obliged me to listen to the others.”
Conditions of coll. learning

Interactions

Effects

(proactive) STRUCTURE

(reactive) REGULATE

SCRIPTS

Semi-Structured Interfaces
Volcanos did it

- Lava flows in India happened then.
  - There are lava flows called Deccan traps from the time of the extinctions
- Krakatoa spread heavy metals around the earth

Meteors could have made it cold and killed them

- Fossils in Montana seem to die out gradually
- Metals found in the rocks from the KT boundary could come from meteors

Belvedere (Suther et al.)
Multi Input Devices: the participation of each learner is “designed” because each mouse only access some screen functions
Multi Input Devices:
The participation of each learner is “designed” because each mouse only access some screen functions.
“Computer-supported collaborative learning” (CSCL)

1990-2000: Technologies **enable** collaboration

2000-2010: Technologies **shape** collaboration (design)
Pedagogical scenario for increasing the probability that interactions X,Y,Z occur in teamwork.
Today’s lesson:

“Please discuss about the pros and cons of collaborative learning and the role of computers!”
Collaboration Script: Pedagogical scenario for increasing the probability that interactions X, Y, Z occur in teamwork.
“Jigsaw”

- Task: How to prevent a large earthquake?
- Roles:
  - Maire of San Francisco
  - Insurance agent
  - Security officer
  - Geologist
- Context: Previous experiments in Denver

In the Jigsaw script, every team member receives a subset of the information necessary to solve the task. This task cannot be solved without the contribution of each individual.
Phase “Groups”

Phase “Experts”
Place the concepts below on the grid in the relation that expresses their similitude or difference. You might change the concepts' place as you define other relations.

"Democracy" vs "Election"

**Relationship:** Similar

**Comments:** Democracy is a form of government in which it is recognized that ultimate authority belongs to the people, who have the right to participate in the decision-making process called elections, to appoint and dismiss their rulers.

Save  Reset
The effort to reach a shared understanding.

Degree of divergence

Random Pairing  Today's Pairing  (Pseudo) Agreement

Shared Understanding

\[ \Delta_1 \]

\[ \Delta_2 \]

\[ \Delta_3 \]

0
DockLamp

A concept map
Holding a concept
Creating a link
Deleting a link
Deleting using paper
Deleting using fingers

Son Do Lenh
Post-test: The cool interface led to lower learning outcomes because there was no need for negotiation.

**No effect in Learning Gain**

- \( m_{\text{COM}} = 25.63, m_{\text{TAN}} = 21.88, \)
- \( t(14) = 1.24, p > .05, \) two-tailed

**More Learning From Partners for Computer**

- \( m_{\text{COM}} = 13.63, m_{\text{TAN}} = 9.13, \)
- \( t(14) = 2.40, p < .05, \) two-tailed

Son Do Lenh
Learning by Teaching
Mastery learning

Socio-Cultural Theories

Individualisation

CSCL

# kids > # computers
"Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals. »

Lev Vygotski
(1896-1934)
Is this North-East?

What time is it?

No

Not that way

10:30

Side? Time? ok

Internalisation
We internalise social interaction because thinking is a dialogue with oneself.
The zone of proximal development (ZPD) has been defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86).
Social interactions in MOOC?

- Videos
- Assignments
- Forum

Engagement

- Social Eliciation
- Verbal elaboration

Completion
Social facilitation is the tendency for people to perform differently when in the presence of others than when alone (Wikipedia)
Social interactions in MOOCs?

Stanford Machine Learning Course CS 229

MeetUPs
Mastery learning

MOOCs

Socio-Cultural Theories

Individualisation

Adapating speed; selecting exercises,....

Collaboration

Forums, concept maps,....

adaptation

interaction
Multiple Sclerosis News

Select article from list below.

Page 1 of 6.  1  2  3  4  5  6

- Emotional response to music can reduce pain, suggests Montreal study
  Jan. 13, 2005
- BioMS Medical receives approval for key multiple sclerosis trial in Britain
  Dec. 10, 2004

Take control of your health. Subscribe to Multiple Sclerosis Monthly Newsletter for FREE!

Preferred Format  HTML  Text

I have read and accept terms of the Privacy Policy.

Email [Enter]  Sign up!  »

- FDA approves new drug to treat multiple sclerosis  Nov. 24, 2004
- Popular MS drug may lack evidence  Nov. 22, 2004
- Jury begins deliberations in three-week assisted suicide trial  Nov. 3, 2004
- Medical users spurning new batch of 'stronger' Health Canada marijuana  Jul. 12, 2004
- U.S. Medicare lottery favours some, others must wait until 2006  Jun. 25, 2004
- Bayer bids to market marijuana-based multiple sclerosis treatment in Canada  May. 11, 2004
- Alberta Tories, families question adequacy of $255 monthly disabled income  May. 9, 2004
- Researchers set out to identify triggers for multiple sclerosis  May. 5, 2004
- Nearly a third of legal marijuana users reject government pot  Apr. 29, 2004
- Sick Kids researchers show strong association between MS.  Apr. 20, 2004
Social Network Analysis
Online Learning Communities

- Visitor (no stable identity)
- Novice (learns how to integrate)
- Regular (comfortably participating in community life)
- Leaders (keep the community running)
- Elders (long-time regulars and leaders who share their knowledge and pass along the culture)

Learning a culture by participation

The social structure of a knowledge community is not flat

(Dutch policemen in charge of drugs)

Social Network Analysis
Summary of chapter 3

1. Collaborative learning is often effective, but not systematically.

2. Good tasks require some degree of interdependence

3. It is effective when rich verbal interactions occur such as explanation, argumentation, mutual regulation

4. To make it more effective, the script increases the necessity for students to produce these interactions

5. The theory behind emphasizes that cognition is inherently social because thinking mostly relies on language.
Social Cognition

The hardware is individual but the software is social
Learning Theory → Pedagogical Model → Learning Technology

CHAPTER 2
- Skinner Behaviorism
- Mastery Learning
- eLearning
- Intelligent tutoring systems

CHAPTER 3
- Vygotsky Socio-cultural theory
- Collaborative Learning
- CSCL

CHAPTER 5
- Piaget Constructivism
- Guided Discovery Learning
- Simulations, microworlds modeling, problem solving
Today 11:15
Minecraft for Ed
@Swiss EdTech Collider