

HOW GROUP DEVELOPMENT TAKES PLACE IN A SOFTWARE ENGINEERING GROUPWORK

Davide Fucci (@dfucci_) and Ehsan Zabardast

Blekinge Institute of Technology

davide.fucci@bth.se

ehsan.zabardast@bth.se

Background

- **Cooperative learning**—i.e., group work
- **Four Group development Stages (GDS)** by *Wheelan et al.*
 1. Dependency & Inclusion
 2. Counter-dependency & Fighting
 3. Trust & Structure
 4. Work & Productivity



Research Questions

RQ1) To what extent the **GDS take place** during a SE groupwork?

RQ2) To what extent the **students' background** impact their conformance to GDS?

RQ3) How does **remote collaboration** affects GDS?

Methodology

- Two surveys based on a simplified version of *Wheelan et al.* tool
 - GSDQ-Simplified 60 → 13 Likert items
 - Developed @Dept. Psychology U. Gothenburg
- Software Engineering course (PA1450)
 - Total effort 6 ECTS
 - Project work 2.5 ECTS
- 70 students attending
 - Civilingenjör Mjukvaruutveckling
 - M.Sc. in Industrial Engineering and Management
 - Master of Science in Engineering: AI and Machine Learning

Study Timeline

PA1450
starts

Projectwork
starts

Survey 1

COVID-19

Survey 2

End Jan

Mid Feb

Mar 31st

April

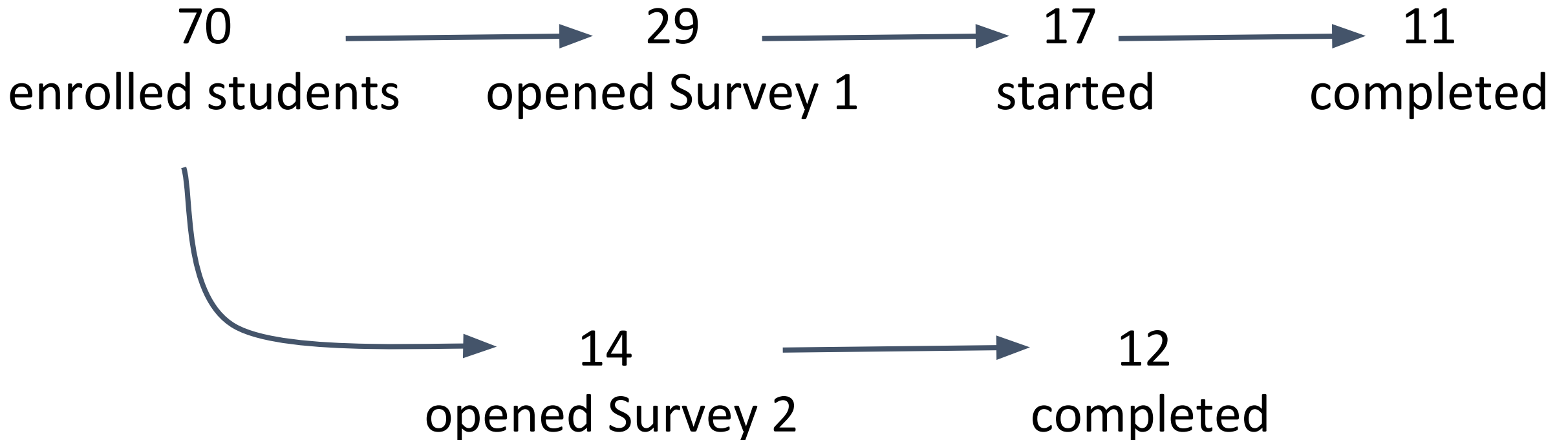
May 19th

Survey Questionnaire

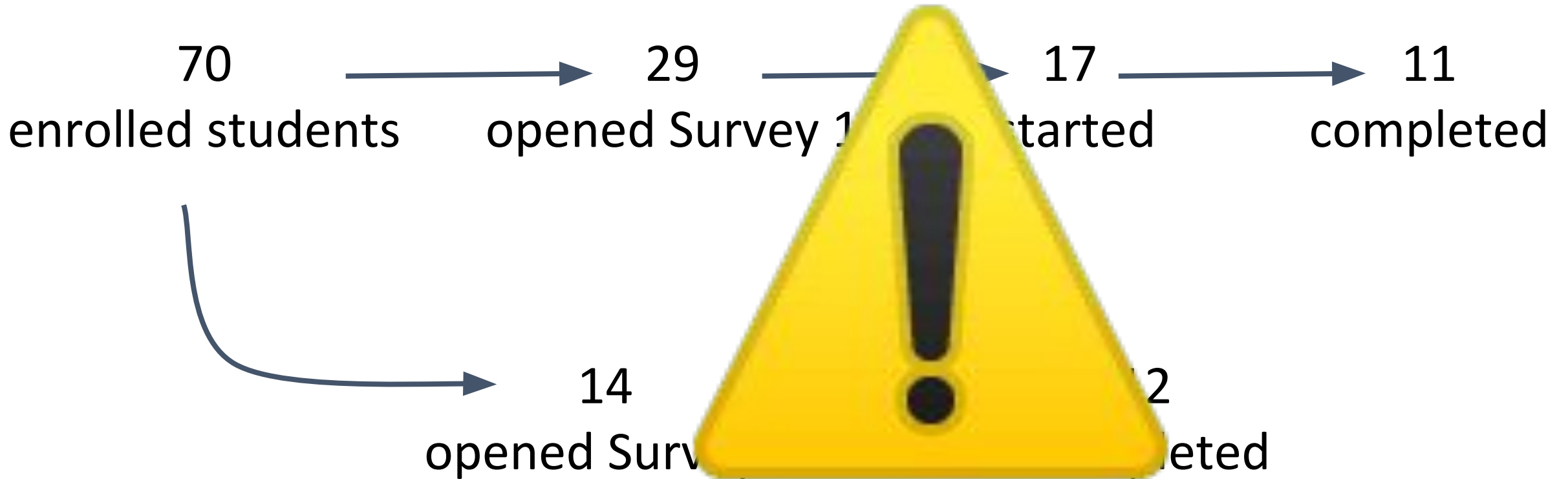
Group	Statement
1	Individuals seem to go along with whatever the group suggests
	When members talk, they address the same few people.
	Members seem very concerned about feeling safe in the group.
	People seem hesitant to express a different point of view
2	People express frustration with how this group is functioning
	The group seems split over a number of issues
	There is quite a bit of tension in the group at this time

Group	Statement
3	Trust is high in this group
	Members are satisfied with the group's progress
	We can rely on each other. We work as a team
4	The group acts on its decisions
	The group encourages innovation and creativity
	Commitment to the group's task is high in this group

Survey Data



Survey Data



Results (RQ1)

Q11. The group acts on its decisions.

	min	max	mean	SD
Survey 1	4.0	5.0	4.5	0.5
Survey 2	3.0	5.0	4.3	0.6

Q13. Commitment to the group's task is high in this group.

	min	max	mean	SD
Survey 1	3.0	5.0	4.3	0.8
Survey 2	3.0	5.0	4.3	0.8

Results (RQ1)

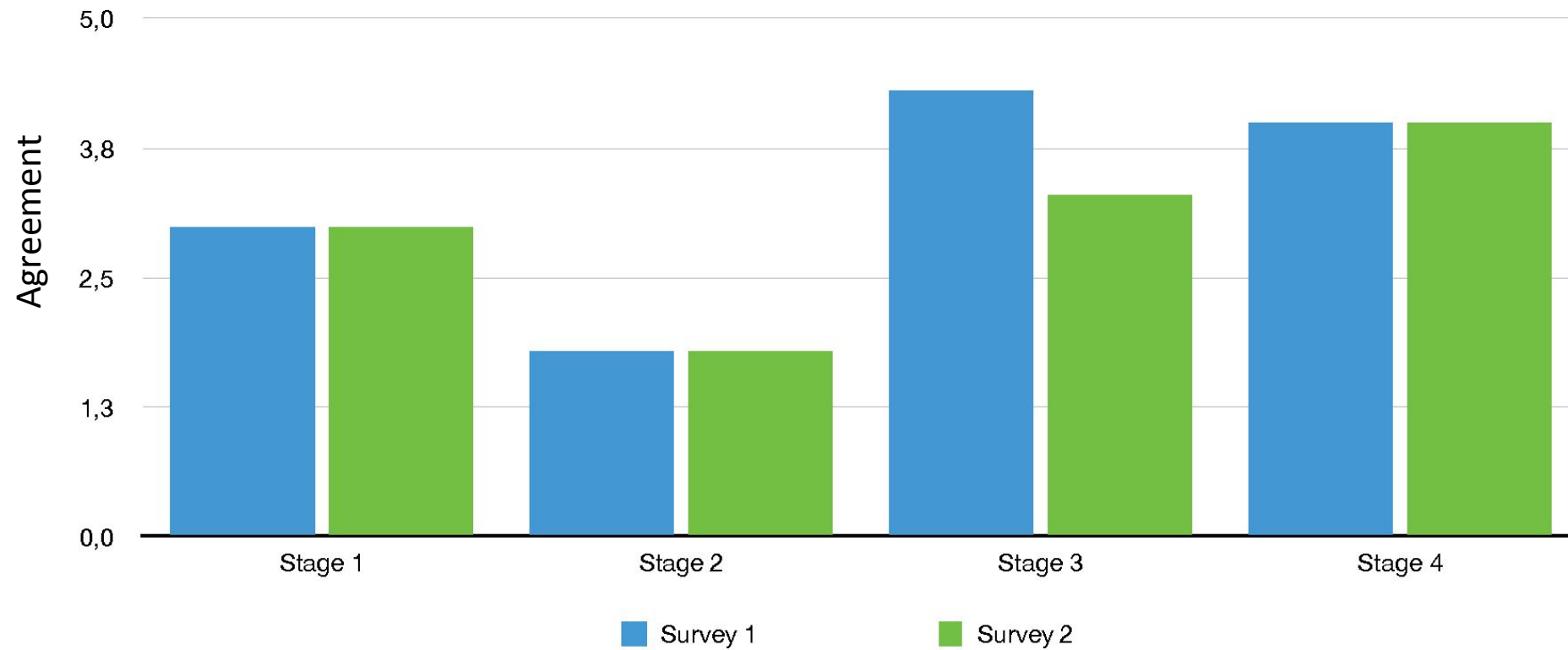
Q3. Members seem very concerned about feeling safe in the group.

	min	max	mean	SD
Survey 1	1.0	5.0	1.8	1.3
Survey 2	1.0	4.0	2.2	1.0

Q7. There is quite a bit of tension in the group at this time.

	min	max	mean	SD
Survey 1	1.0	5.0	2.2	1.4
Survey 2	1.0	3.0	1.8	0.6

Results (RQ1)

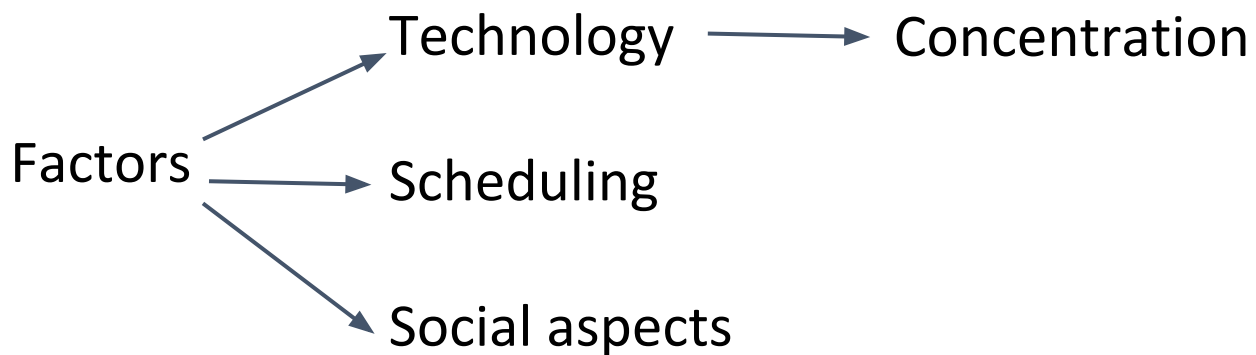


Results (RQ3)

Rate the complexity of working with group mates remotely.

	n	min	max	mean	SD
Survey 1	11	2.0	5.0	3.6	1.2
Survey 2	12	2.0	5.0	3.3	0.9

How working remotely influenced your group work?



“People start doing other things on their computer that is not apart of the project.”

Results (RQ3)

Social Aspects

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graph TD; SA[Social Aspects] --> LI[Limited interaction]; SA --> PS[Peers' support]; SA --> PCP[Peers' character & personality];
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Limited interaction

“Not being able to point at each others’ screens. Not being able to sketch stuff on a whiteboard or a piece of paper.”

Peers’ support

“Bringing the best out of each other is important if we are going to work together and efficient. This is impossible when we are working remotely”

Peers’ character&personality

“It is more difficult with these type of people with strong opinions who think they know best but don’t always do.”

Conclusion

It wasn't possible to observe (a complete) evolution of the groups

- Not enough observations
- Too mature

Remote collaboration impacted several social aspects perhaps hindering the groups reaching full productivity

Future Work

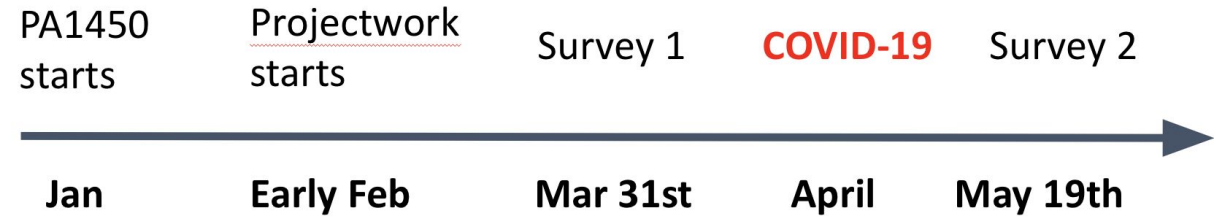
- Replicate with the same working condition over time
- “Push” harder to get responses to the survey
- Involve groups supervisors and teachers (e.g., interviews)
- Perform per-group analysis
- Include objective metrics to assess the phases

Background

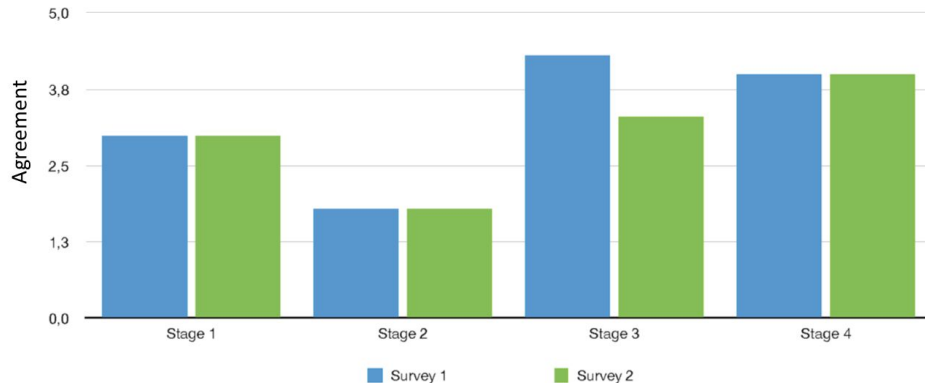
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Study Timeline



Results (RQ1)



Results (RQ3)

