

The effect of interdisciplinary teamwork on creativity through knowledge heterogeneity and synthesis in a technological domain

SUPPLEMENTARY MATERIAL

Listing of all survey questions

Here follow the exact questions from the survey. Assume open answer unless specified otherwise.

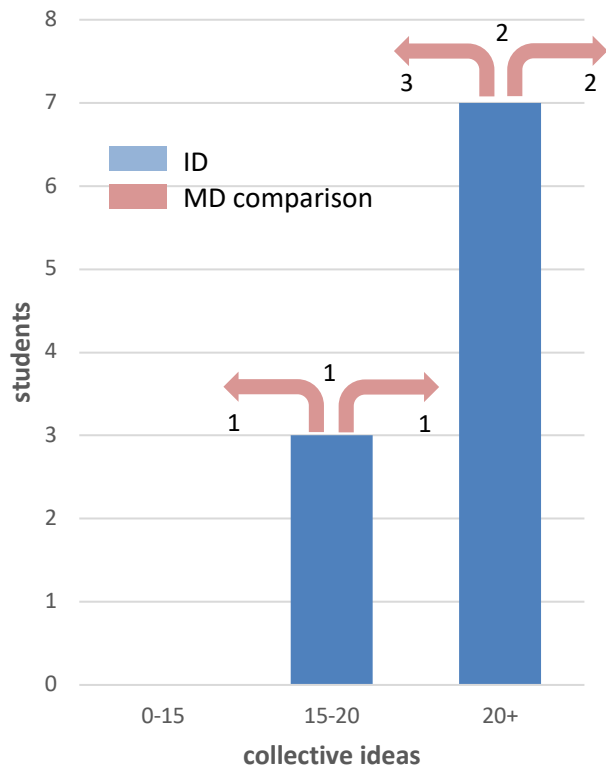
- (a) Study background
 - a. Applied Earth Science
 - b. Architecture
 - c. Astronomy
 - d. Business
 - e. Computer Science
 - f. Design for Interaction
 - g. Engineering
 - h. Finance & Investment
 - i. Mathematics
 - j. Management of Innovation
 - k. Physics
- (b) Team number
 - a. 1
 - b. 2
 - c. 3
 - d. 4
 - e. 5
- (c) How many ideas did your team together come up with in this project during the divergent/brainstorming phase (interdisciplinary)?
 - a. 5 to 10
 - b. 10 to 15
 - c. 15 to 20
 - d. More than 20
- (d) How does this compare with idea generation during the divergent phase in mono-disciplinary projects?
 - a. More than ID projects
 - b. Equal to ID projects
 - c. Less than ID projects
- (e) How many ideas did you personally come up with in this project during the divergent/brainstorming phase (interdisciplinary)?
 - a. 0 to 5
 - b. 5 to 10
 - c. 10 to 15
 - d. 15 to 20
 - e. Other
- (f) How does this compare with individual idea generation during the divergent phase in mono-disciplinary projects?
 - a. More than ID projects
 - b. Equal to ID projects
 - c. Less than ID projects
- (g) Please rate your agreement with the following statements. During the divergent phase...
 - a. I enjoy learning from different knowledge of other team members
 - i. Strongly Agree (for all following statements)
 - ii. Somewhat Agree (for all following statements)
 - iii. Neutral (for all following statements)
 - iv. Somewhat Disagree (for all following statements)
 - v. Strongly Disagree (for all following statements)

- b. Different knowledge within the team hinders communication
 - i. Etc.
 - c. Different knowledge within the team brings us new perspectives
 - d. I enjoy working in a monodisciplinary teams
 - e. I am able to explain my knowledge to my team members
 - f. I enjoy working in interdisciplinary teams
 - g. I feel like I can learn more in interdisciplinary teams
 - h. In our team, we make an effort to help each other understand different knowledge
 - i. The knowledge in the team clashes at times
 - j. I notice the difference between my knowledge and that of my teammates
 - k. My team members and I coordinate our differing knowledge actively
 - l. I am able to criticise my team member's ideas
 - m. My team members are able to explain their knowledge to me
 - n. I experience a gap in professional language used by the different members of my team
 - o. I believe that conflicts bring our team discussions further
 - p. The knowledge in my team is well-rounded
 - q. The skills within the team complement each other
 - r. There are many misunderstandings in my team
 - s. I feel okay to provide feedback on my team members' ideas
 - t. I am able to communicate my assumptions to my team clearly
 - u. I have discovered some of my tacit assumptions in interdisciplinary teamwork
 - v. My team members clearly communicate their knowledge to me
 - w. I feel comfortable with conflict in the interdisciplinary team
 - x. I avoid discussions
 - y. My team members value my feedback
- (h) How do these hiccups hinder idea generation?
- (i) Which team (in your experience) generates the largest number of ideas (quantitative)?
- a. ID teams
 - b. MD teams
 - c. Both
- (j) Which kind of team (in your experience) brings out the most useful ideas (qualitative)?
- a. ID teams
 - b. MD teams
 - c. Both
- (k) Do you have tips on how to work effectively in an interdisciplinary team?

Grouping of the statements into topics

Supp. Tab. 1. Grouping of the individual questions into 6 topics. The bold indicated questions counted negatively to the overall agreement for that topic.

| Topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------------------------------|----------|---|----------|---|---|---|----------|
| size of knowledge gap | b | i | j | n | r | u | - |
| active communication | e | h | k | m | t | v | x |
| feedback | l | s | y | - | - | - | - |
| enjoyment in ID compared to MD | d | f | w | - | - | - | - |
| productivity and learning | a | c | g | o | - | - | - |
| well-rounded teams | p | q | - | - | - | - | - |



Supp. fig. 1. Histogram of the number of students Uncategorized averages for the agreement questions from the survey

Supp table 2. Uncategorized averages for the agreement questions from the survey.

| Statement | Team 2 | Team 3 | Team 4 | Team 5 |
|--|--------|--------|--------|--------|
| I enjoy learning from different knowledge of other team members | 100.0 | 50.0 | 100.0 | 100.0 |
| Different knowledge within the team hinders communication | 50.0 | 50.0 | 33.3 | 50.0 |
| Different knowledge within the team brings us new perspectives | 100.0 | 50.0 | 100.0 | 100.0 |
| I enjoy working in a monodisciplinary teams | 66.7 | 33.3 | 58.3 | 58.3 |
| I am able to explain my knowledge to my team members | 100.0 | 33.3 | 83.3 | 66.7 |
| I enjoy working in interdisciplinary teams | 100.0 | 50.0 | 83.3 | 100.0 |
| I feel like I can learn more in interdisciplinary teams | 66.7 | 50.0 | 100.0 | 83.3 |
| In our team, we make an effort to help each other understand different knowledge | 88.9 | 50.0 | 100.0 | 100.0 |
| The knowledge in the team clashes at times | 44.4 | 58.3 | 25.0 | 50.0 |
| I notice the difference between my knowledge and that of my teammates | 66.7 | 33.3 | 100.0 | 83.3 |
| My team members and I coordinate our differing knowledge actively | 100.0 | 33.3 | 83.3 | 83.3 |
| I am able to criticise my team member's ideas | 100.0 | 33.3 | 83.3 | 83.3 |
| My team members are able to explain their knowledge to me | 88.9 | 33.3 | 83.3 | 66.7 |
| I experience a gap in professional language used by the different members of my team | 33.3 | 16.7 | 33.3 | 66.7 |
| I believe that conflicts bring our team discussions further | 61.1 | 33.3 | 83.3 | 75.0 |
| The knowledge in my team is well-rounded | 88.9 | 33.3 | 75.0 | 83.3 |
| The skills within the team compliment each other | 88.9 | 33.3 | 83.3 | 100.0 |
| There are many misunderstandings in my team | 16.7 | 50.0 | 25.0 | 33.3 |
| I feel okay to provide feedback on my team members' ideas | 100.0 | 50.0 | 100.0 | 83.3 |
| I am able to communicate my assumptions to my team clearly | 77.8 | 33.3 | 66.7 | 66.7 |
| I have discovered some of my tacit assumptions in interdisciplinary teamwork | 50.0 | 33.3 | 50.0 | 58.3 |
| My team members clearly communicate their knowledge to me | 100.0 | 33.3 | 83.3 | 83.3 |
| I feel comfortable with conflict in the interdisciplinary team | 83.3 | 50.0 | 83.3 | 83.3 |
| I avoid discussions | 22.2 | 50.0 | 16.7 | 16.7 |
| My team members value my feedback | 100.0 | 33.3 | 83.3 | 66.7 |

Supp table 3. Categorized averages for the agreement questions from the survey. The lowest row shows the average number of personal ideas generated.

| Teams | 2 | 3 | 4 | 5 |
|---------------------------|--------|-------|-------|--------|
| size of knowledge gap | 43.52 | 40.28 | 44.44 | 59.72 |
| active communication | 79.17 | 33.33 | 72.92 | 68.75 |
| enjoyment | 72.22 | 55.56 | 69.44 | 75.00 |
| feedback | 100.00 | 38.89 | 88.89 | 88.89 |
| productivity and learning | 81.94 | 45.83 | 95.83 | 100.00 |
| well-rounded team | 88.89 | 33.33 | 79.17 | 79.17 |
| Personal ideas | 20 | 7.5 | 12.5 | 15 |