

Digital competences in computer-supported collaborative learning

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Research questions I

Context: part of dissertation research in the field of the dynamics of computer-supported collaborative learning (CSCL) within managerial simulation game “Manahra”

1. Which types of digital competences CSCL develops according to the Manahra's students?
2. Which CSCL components related to the digital competences are crucial for accomplishment according to the Manahra's students?

Manahra

- 150–220 students divided to 10–15 study groups
- 1 group = 1 top management of car maker
 - CEO, chiefs of departments, common members
- **semesterwide activity, 7 days per week**
 - 1 week = 1 round of competition
- every round many tasks to fulfil (production, accounting, marketing, HR etc.)
- management, decisions, responsibility, redistribution of financial rewards – fully on students
- teacher = referee

CSCCL components: Big Five in teamwork

Model representing team/group dynamics (Salas, Sims & Burke, 2005): 8 components:

Supporting coordinating mechanisms:

1. shared mental models
2. closed-loop communication
3. mutual trust

Core components:

1. leadership
2. mutual performance monitoring
3. backup behaviour
4. team orientation
5. adaptability

Methodology I

Qualitative approach – exploratory inquiry – 11 in-depth interviews with students at different positions:

- 3× CEO (head of whole study group)
- 4× chief of department (3–4 departments per group)
- 4× common member (no subordinates)

– transcript – coding – analytical story

Results I

Computer-supported collaborative learning within Manahra develops three digital competences at least:

- **skills for work with MS Excel (or similar software)**
 - consequence of the nature of the tasks in Manahra
- **skills to use digital tools for monitoring groupmates**
 - the longer CSCL activity, the higher need for this
- **online communication**
 - no surprise as the communication is the gist of collaborative learning

Excel

Many tasks required MS Excel sheets processing (joining tables, advanced filtering, programming etc.) – digital competence specific to Manahra:

Filoména:

- “as I struggle with computer and I was worried about that Excel, then I have greatly appreciated it”

Karel:

- “I know how much work is done in the excel tables ... so fact I was able to automate it at whole I would say it as my personal success”

Digital tools for monitoring groupmates

Students in the positions of chiefs check the work of their groupmates ...

... but more eyes see more things:

“Before they turned it in [assignment], they just put it on Facebook to be read it by all, either to fix bugs, or just say what is unclear, what's wrong, and so on” (Jarmila)

Mutual performance monitoring (using diverse online tools) was crucial for the team accomplishment.

Online communication

“What we've been together in my department, it was always, we've been writing it all the time, I've probably written the most messages for my whole life” (Filoména)

Admitted troubles:

- too many digital tools for online communication
- long delays between text messages
- pending / unfinished discussions
- absence of an information coordinator

Effective and closed-loop online communication was crucial for the team accomplishment.

Communication barriers and competences

In my review study (Poláček, 2015) I have identified six levels of communication barriers:

1. availability and reliability of technologies
2. glut of information and technologies
3. fear of losing privacy
4. slow exchange of information
 - effective communication competence
5. unfinished communication
 - productive communication competence
6. lack of social interactions
 - social expression competence

Research hypotheses

1. Level of reported effective com. competence correlate with perceived level of team orientation
 - more efficient com. – greater willingness to cooperate
2. Level of reported productive com. competence correlate with perceived level of group norms
 - more productive com. – better agreement of “who do what”
3. Level of reported social expression competence correlate with perceived level of encouraging and supporting behaviour
 - more social – more helping

Methodology II

Quantitative approach – survey – 156 students
(response rate = 86.2%)

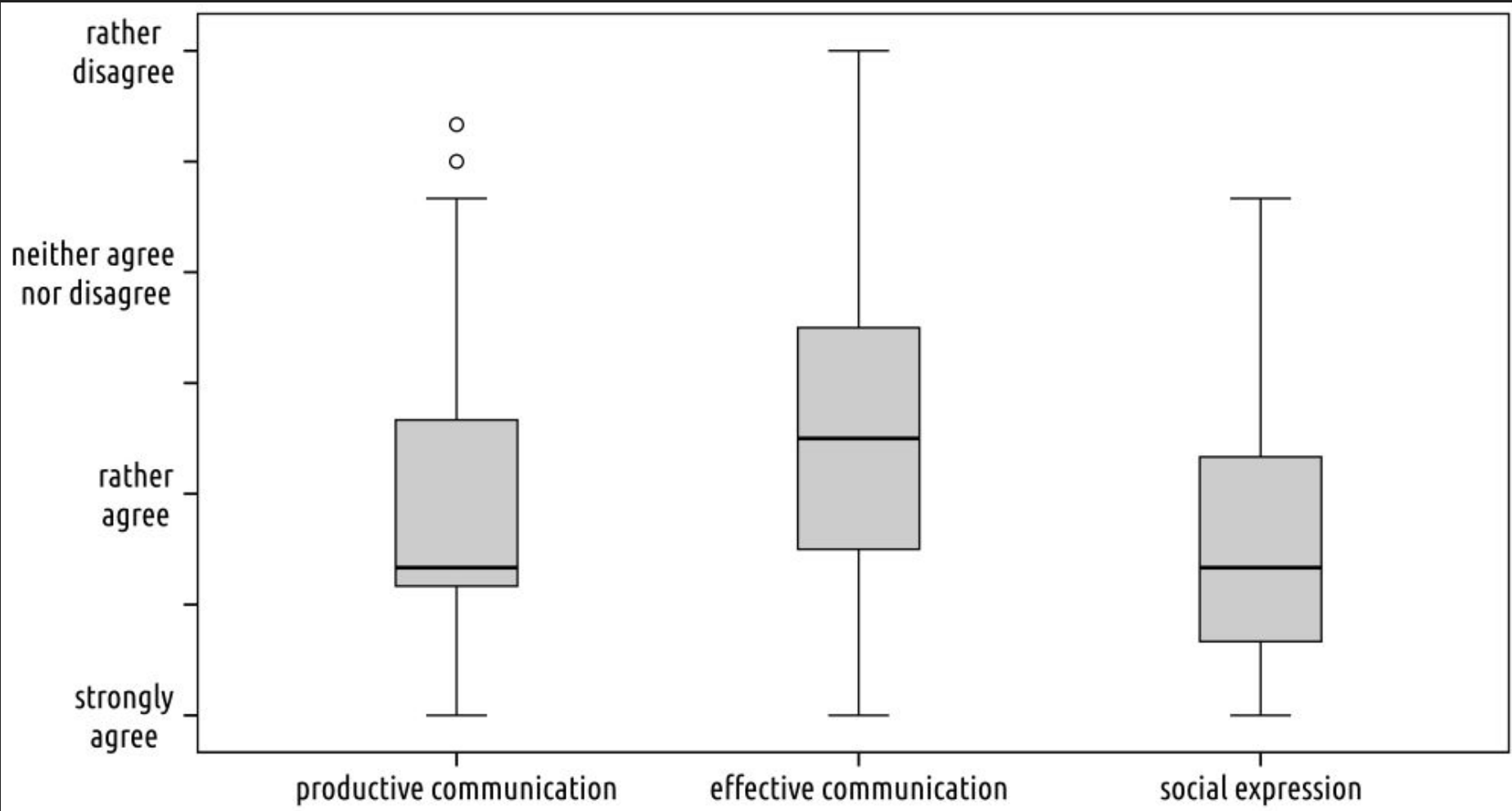
Batteries of statements (4 at least for each component /
competence) – Likert scale

– communication competences adapted from (Spitzberg, 2006)

Factor analyses to extract indicators (latent variables)

Pearson's correlations

Communication competences distribution



Communication competences distribution

Pearson's correlations ($N = 156$)

		effective	productive	social
Team orientation	Pearson Correlation	.061	.126	.098
	Sig. (2-tailed)	.449	.117	.223
Group norms	Pearson Correlation	-.029	.027	.096
	Sig. (2-tailed)	.720	.740	.235
Helping behaviour	Pearson Correlation	.031	.121	.240**
	Sig. (2-tailed)	.703	.134	.003

** Correlation is significant at the 0.01 level (2-tailed).

Same table for male top managers

Pearson's correlations ($N = 30$)

		effective	productive	social
Team orientation	Pearson Correlation	.165	.642**	-.097
	Sig. (2-tailed)	.382	.000	.608
Group norms	Pearson Correlation	.188	.374*	.122
	Sig. (2-tailed)	.319	.042	.522
Helping behaviour	Pearson Correlation	-.051	.048	.304
	Sig. (2-tailed)	.079	.802	.102

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Conclusion

Hypotheses 1 and 2 were rejected.

Hypothesis 3 was (partly) supported:

student reporting more social element in their online communication also reported more encouraging and supporting behaviour

Superior positions in Manahra have important influence to the dynamics of CSCL ...

... but link between communication competences and various roles in CSCL needs further investigations.

Similarly this is valid for the competence of online mutual performance monitoring.

References

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