Does Scientific Evaluation Matter?

The impact of scientific evaluation on the development of a digital EU simulation game

Sven Ivens
Georg-August-University Göttingen

26/09/2019
Seventh Annual Conference on Citizenship Education
University of Roehampton, London

GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN

Structure

- **Background**

- Aims and Research Questions

- Study Design

- Results

- Conclusion

Background EU Simulation Game

- 90-minute synchronous online simulation games, decision making processes of the European Parliament (asylum policy, data protection), by *planpolitik* (Berlin)

- 15-30 players per simulation playing members of parliament

- Launch in 2015/2016 funded by the European Information Center of Lower Saxony

- Renewed for 10 games in 2017/2018 and 10 games in 2019

Theoretical Background

Simulation games as an action-, experience- and process-oriented method of political education

Learning objectives / expectations *(see for example Hartmann/Weber 2013; Klippert 2008; Massing 2008; Rappenglück 2004/2008)*:

- Making complexity comprehensible, especially with regard to the political process

- Sustainable, experience-based knowledge transfer

- Linking the political with the everyday life of the learner

- Insight into the difficulty of finding political compromises

- Motivation, awakening / raising of political interest

Theoretical Background

Problems of the simulation game method:

- high time expenditure

- lack of seriousness: "fun" without learning effect

- Teaching of an inadequate illusion of reality

- Requirement: teaching of basic knowledge in advance

- Limited controllability: own dynamic and open results

- however:

Lack of systematically gained empirical findings
(especially related to EU education) (see *Gosen & Washbush 2004*)

    -> Need for research concerning effects of EU simulation games

Theoretical Background

Potentials of computer-based learning games *(see for example van Eck 2006; Girard et al. 2013; Motyka 2017)*

Potentials of digital simulation games *(see for example Kaiser et al. 2017; Wouters 2013; Charsky 2010)*:

- Synchronous – asynchronous

- Only digital – blended learning

- Constructive learning environment

- Long-term effects

- …..

 Overall lack of empirical studies about digital simulation games for civic education and a lack of good praxis examples

Structure

- Background

- **Aims and Research Questions**

- Study Design

- Results

- Conclusion

Aims of the Evaluations

Systematically study:

 Effects of short digital EU simulation games on political motivations, attitudes and knowledge of the students

 Quality of simulation game from a student's point of view

Aims of the Study

- Effect of the evaluations on the development of the simulation game

- Usefulness and significance of the evaluations for the developers/ practical use of the evaluations outside of science

- Possibility to document change in the simulation game using the evaluation data

- Identify possible improvements/deteriorations for digital simulation games

Research Questions

- **Question 1:** Did the evaluations help to further develop the EU simulation game and did the changes lead to a more positive assessment of the simulation game?

- **Question 2:** Can we see changes made by the developers in-between the evaluations by comparing the evaluation results and did these changes improve/worsen the simulation?

Structure

- Background an

- Aims and Research Questions

- **Study Design**

- Results

- Conclusion

Design of the Study

- quantitative study using a standardized questionnaire with open and formatted questions for 3 measuring points (intervention study further details Oberle et al 2017)

- Data collection (all from schools in Lower Saxony):

- 2015/2016 N= 209 pupils

- 2017/2018 N= 97 pupils

- 2019 N= 75 pupils

- All three evaluations have acceptable fit measurement values for latent constructs

Design of the Study

Mixed-method-design:

☐ **Comparison of the evaluation results** and generating hypothesis and interview questions

☐ **Interview** with the simulation game developer from *planpolitik*

☐ **Analysing of the interview answers** to find possible improvements

Structure

- Background

- Aims and Research Questions

- Study Design

- **Results**

- Conclusion

The Chat System Problem

category	2015/2016		2017/2018		2019	
	Mean	Cohens' d to 2017/2018	Mean	Cohens' d to 2019	Mean	Cohens's to 2015/2016
Prepartion phase of the simulation	2,98	-.13	2,88	-.15	2,79	**-.33**
Layout of the simulation	3,31	**-.26**	3,14	.05	3,17	-.21
Description of your role	3,19	-.12	3,10	-.09	3,04	-.20
Work instructions	2,99	**-.27**	2,79	.08	2,85	-.16
Time management	2,67	-.12	2,57	-.09	2,50	**-.22**
Technical features general	2,83	.01	2,84	-.06	2,80	-.04
Technical features of the chat	2,75	**.31**	3,02	.07	3,07	**.38**
Communication by chat	2,67	**.45**	3,06	-.25	2,87	**.22**
Results of the simulation	2,50	-.17	2,33	**.54**	2,79	**.32**

Cohen's d: No Effect > 0.2, Small Effect 0.2 – 0.5, Medium Effect 0.5-0.8, Large Effect < 0.8
Mean Values: 4 high Approvel, 1 Disapproval

The Chat System Problem

What would make the simulation game better?						
	2015/2016		2017/2018		2019	
Category	Mention	Percent	Mention	Percent	Mention	Percent
More detailed explanations of the roles and tasks	8	10,7%	23	27,1%	14	21.2%
More time	21	28%	15	17,6%	11	16.9%
Fix technical errors	**25**	**33,3%**	**10**	**11,8%**	**3**	**4.6%**
Expand structures/personnel	8	10,7%	10	11,8%	11	16.9%
Better (final) voting options			4	**4,7%**		
Less time/ shorter waiting time			3	**3,5%**	8	**12.3%**
Clearer Design	3	4			1	1.5%
Not so many emails					4	**6.2%**
No suggestions for improvement					4	6.2%
Other	10	13,3%	5	5,9%	9	13.8%
Overall	75	100%	85	100%	65	100%

The Chat System Problem

What did you not like about the simulation game?						
	2015/2016		**2017/2018**		**2019**	
Category	**Mention**	**Percent**	**Mention**	**Percent**	**Mention**	**Percent**
Lack of explanations			21	**25,3%**	11	**13.9%**
Time management/ brevity of the game	21	**28,8%**	17	**20,5%**	14	**17.7%**
End of the game/ final vote	3	4,1%	14	**16,9%**		
Problems with the behavior of other players	8	11%	13	15,7%	13	16.5%
Technical problems (Chat in 2015/2016)	17	**23,3%**	7	**8,4%**	13	**16.5%**
Too long/ long waiting times			3	3,6%	7	8.9%
Design of the game					9	11.4%
Other	5	6,8%	8	9,6%	8	10.1%
Length of the survey/ questionnaire	19	26%				
Overall	73	100%	83	100%	79	100%

The Chat System Problem

What did you like about the simulation game?						
	2015/16		**2017/18**		**2019**	
Category	**Mention**	**Percent**	**Mention**	**Percent**	**Mention**	**Percent**
Communication with each other	21	38,1%	35	42,6%	27	29.7%
Role identification	5	**9,1%**	14	**17,1%**	15	**16.5%**
Insight into politics/EU/legislation	10	18,2%	9	11%	15	16.5%
Diversity	3	5,5%	7	8,5%	3	3.3%
Digital learning			3	3,7%	1	1.1%
Design and layout of the simulation game	12	21,8%			11	12.1%
Chat functions					8	**8.8%**
(End-)Voting in the game					2	2.2%
Others	4	7,3%	14	17,1%	9	9.9%
Overall	55	100%	82	100%	91	100%

The Chat System Problem Hypothesis

- Strong criticism against the chat system in 2015/2016

- Positive change in the later evaluations up to praise for the chat system in 2019

☐ Hypothesis: After the negative evaluation in 2015/2016 *planpolitik* improved the chat system which led to a positive assessment.

The Interview Result

Interviewer: It can be seen from the results of 2015/2016 both in the open questions and in the evaluation of the simulation game that the chat and the chat function were seen very critical by the participants. Did you (*planpolitik*) react to this result of the evaluation?

planpolitik: **Yes for sure! That was a little bit like a slap in the face for us**. In technical developments, especially in this phase, there are always problems. The implementations that we made there at the beginning with **the schools that you also evaluated 2015, 2016 were simply super important for us to find all these problems** and to see them as well and **of course we responded to that and then made improvements** in many ways.

The Final Vote/Result

category	2015/2016		2017/2018		2019	
	Mean	Cohens' d to 2017/2018	Mean	Cohens' d to 2019	Mean	Cohens's to 2015/2016
Prepartion phase of the simulation	2,98	-.13	2,88	-.15	2,79	**-.33**
Layout of the simulation	3,31	**-.26**	3,14	.05	3,17	-.21
Description of your role	3,19	-.12	3,10	-.09	3,04	-.20
Work instructions	2,99	**-.27**	2,79	.08	2,85	-.16
Time management	2,67	-.12	2,57	-.09	2,50	**-.22**
Technical features general	2,83	.01	2,84	-.06	2,80	-.04
Technical features of the chat	2,75	**.31**	3,02	.07	3,07	**.38**
Communication by chat	2,67	**.45**	3,06	-.25	2,87	**.22**
Results of the simulation	2,50	-.17	2,33	**.54**	2,79	**.32**

Cohen's d: No Effect > 0.2, Small Effect 0.2 – 0.5, Medium Effect 0.5-0.8, Large Effect < 0.8
Mean Values: 4 high Approvel, 1 Disapproval

The Final Vote/Result

What did you not like about the simulation game?						
	2015/2016		2017/2018		2019	
Category	Mention	Percent	Mention	Percent	Mention	Percent
Lack of explanations			21	**25,3%**	11	**13.9%**
Time management/ brevity of the game	21	**28,8%**	17	**20,5%**	14	**17.7%**
End of the game/ final vote	3	4,1%	14	**16,9%**		
Problems with the behavior of other players	8	11%	13	15,7%	13	16.5%
Technical problems	17	**23,3%**	7	**8,4%**	13	**16.5%**
Too long/ long waiting times			3	3,6%	7	8.9%
Design of the game					9	11.4%
Other	5	6,8%	8	9,6%	8	10.1%
Length of the survey/ questionnaire	19	26%				
Overall	73	100%	83	100%	79	100%

The Final Vote/Result

What would make the simulation game better?						
	2015/2016		**2017/2018**		**2019**	
Category	**Mention**	**Percent**	**Mention**	**Percent**	**Mention**	**Percent**
More detailed explanations of the roles and tasks	8	10,7%	23	27,1%	14	21.2%
More time	21	28%	15	17,6%	11	16.9%
Fix technical errors	25	**33,3%**	10	**11,8%**	3	**4.6%**
Expand structures/personnel	8	10,7%	10	11,8%	11	16.9%
Better (final) voting options			4	**4,7%**		
Less time/ shorter waiting time			3	**3,5%**	8	**12.3%**
Clearer Design	3	4			1	1.5%
Not so many emails					4	**6.2%**
No suggestions for improvement					4	6.2%
Other	10	13,3%	5	5,9%	9	13.8%
Overall	75	100%	85	100%	65	100%

The Final Vote/Result

What did you like about the simulation game?						
	2015/16		**2017/18**		**2019**	
Category	**Mention**	**Percent**	**Mention**	**Percent**	**Mention**	**Percent**
Communication with each other	21	38,1%	35	42,6%	27	29.7%
Role identification	5	**9,1%**	14	**17,1%**	15	**16.5%**
Insight into politics/EU/legislation	10	18,2%	9	11%	15	16.5%
Diversity	3	5,5%	7	8,5%	3	3.3%
Digital learning			3	3,7%	1	1.1%
Design and layout of the simulation game	12	21,8%			11	12.1%
Chat functions					8	**8.8%**
(End-)Voting in the game					2	2.2%
Others	4	7,3%	14	17,1%	9	9.9%
Overall	55	100%	82	100%	91	100%

The Final Vote/Result Hypothesis

- Rising criticism about the final voting system in 2017/2018 in the open questions and a very low rating in the questionnaire

- Positive rating in 2019 and no negative comments in the open questions

☐ Hypothesis: *planpolitik* made an improvement to the final vote/end result after the negative second evaluation in 2017/2018.

The Interview Result

Interviewer: 2017/2018 the end of the simulations game respectively the final vote was especially criticized. Did you change or customized the voting respectively the final vote of the game after the critical results of the evaluation?

planpolitik: No, we did not. That is also confusing for me. No idea. We did not change anything.

Interviewer: So absolutely nothing?. Since 2015 is was always the same?

planpolitik: Although no, yes. Right. **In 2015 it was still free text**. And so everyone could formulate each word individually, and in 2017(/2018) we changed it so that we use **predefined sentence building blocks as drop-downs**, that's what you call them, so you can select them by clicking on such a field. **In 2015 we found out, that it was not working well, were then pointed out by you again. And than we changed it.**

Further Role Identification

What did you like about the simulation game?						
	2015/16		2017/18		2019	
Category	Mention	Percent	Mention	Percent	Mention	Percent
Communication with each other	21	38,1%	35	42,6%	27	29.7%
Role identification	5	**9,1%**	14	**17,1%**	15	**16.5%**
Insight into politics/EU/legislation	10	18,2%	9	11%	15	16.5%
Diversity	3	5,5%	7	8,5%	3	3.3%
Digital learning			3	3,7%	1	1.1%
Design and layout of the simulation game	12	21,8%			11	12.1%
Chat functions					8	**8.8%**
(End-)Voting in the game					2	2.2%
Others	4	7,3%	14	17,1%	9	9.9%
Overall	55	100%	82	100%	91	100%

Further Role Identification but less Information about the Role

What would make the simulation game better?						
	2015/2016		**2017/2018**		**2019**	
Category	Mention	Percent	Mention	Percent	Mention	Percent
More detailed explanations of the roles and tasks	8	10,7%	23	27,1%	14	21.2%
More time	21	28%	15	17,6%	11	16.9%
Fix technical errors	25	**33,3%**	10	**11,8%**	3	**4.6%**
Expand structures/personnel	8	10,7%	10	11,8%	11	16.9%
Better (final) voting options			4	**4,7%**		
Less time/ shorter waiting time			3	**3,5%**	8	**12.3%**
Clearer Design	3	4			1	1.5%
Not so many emails					4	**6.2%**
No suggestions for improvement					4	6.2%
Other	10	13,3%	5	5,9%	9	13.8%
Overall	75	100%	85	100%	65	100%

Further Role Identification but less Information about the Role

category	2015/2016		2017/2018		2019	
	Mean	Cohens' d to 2017/2018	Mean	Cohens' d to 2019	Mean	Cohens's to 2015/2016
Preparation phase of the simulation	2,98	-.13	2,88	-.15	2,79	**-.33**
Layout of the simulation	3,31	**-.26**	3,14	.05	3,17	-.21
Description of your role	3,19	-.12	3,10	-.09	3,04	-.20
Work instructions	2,99	**-.27**	2,79	.08	2,85	-.16
Time management	2,67	-.12	2,57	-.09	2,50	**-.22**
Technical features general	2,83	.01	2,84	-.06	2,80	-.04
Technical features of the chat	2,75	**.31**	3,02	.07	3,07	**.38**
Communication by chat	2,67	**.45**	3,06	-.25	2,87	**.22**
Results of the simulation	2,50	-.17	2,33	**.54**	2,79	**.32**

Cohen's d: No Effect > 0.2, Small Effect 0.2 – 0.5, Medium Effect 0.5-0.8, Large Effect < 0.8
Mean Values: 4 high Approval, 1 Disapproval

Further Role Identification but less Information about the Role Hypothesis

- Over the course of the evaluations there is an increase in role identification

- On the other hand the complains in the open questions about missing information about the role is increasing as well.

☐ Hypothesis: *planpolitik* changed the role profile to less information and make it easier to identify with the role.

The Interview Result

Interviewer: Since 2015/2016 role identification is increasing, at 2015/2016 it was relatively low with 9% and nearly doubled after that. Did you do something with the role description over time?

Planpolitik: **Yes, we have revised the role description**. The page **used to be just statistical information**, like a book, just plain text. We have divided these (page) into three modules, let's say. And then small questions in between**. So we have included several interactive elements**.

Did the Simulation Game get easier?

category	2015/2016		2017/2018		2019	
	Mean	Cohens'd to 2017/2018	Mean	Cohens'd to 2019	Mean	Cohens'd to 2015/2016
interesting	2.97	**-.20**	2.82	**.27**	3.00	.04
diversified	2.79	**-.22**	2.61	**.20**	2.76	-.04
informative	2.78	**-.46**	2.43	**.56**	2.82	.06
exciting	2.76	**-.29**	2.53	.06	2.57	**-.27**
exhausting	2.47	**-.69**	1.93	**.51**	2.27	**-.28**
too short	2.46	-.08	2.38	-.16	2.24	**-.25**
nerve-racking	2.40	**-.37**	2.07	**.26**	2.29	-.12
realistic	2.32	**.32**	2.57	.09	2.63	**.40**
too superficial	2.29	-.10	2.21	**.29**	2.43	.18
too easy	2.05	-.04	2.02	.15	2.11	.09
boring	2.02	.11	2.11	0	2.11	.12
too long	1.76	-.11	1.68	**.40**	1.96	**.28**
too difficult	1.68	**-.30**	1.48	.18	1.58	-.15

Easier but also with less explanations

What did you not like about the simulation game?						
	2015/2016		2017/2018		2019	
Category	Mention	Percent	Mention	Percent	Mention	Percent
Lack of explanations			21	**25,3%**	11	**13.9%**
Time management/ brevity of the game	21	**28,8%**	17	**20,5%**	14	**17.7%**
End of the game/ final vote	3	4,1%	14	**16,9%**		
Problems with the behavior of other players	8	11%	13	15,7%	13	16.5%
Technical problems	17	**23,3%**	7	**8,4%**	13	**16.5%**
Too long/ long waiting times			3	3,6%	7	8.9%
Design of the game					9	11.4%
Other	5	6,8%	8	9,6%	8	10.1%
Length of the survey/ questionnaire	19	26%				
Overall	73	100%	83	100%	79	100%

Did the Simulation Game get easier? Hypothesis

- The simulation game were rated less exhausting, informative, nerve-racking, exciting and difficult but a bit more realistic in 2017/2018.

- Participants complained about the lack of explanations in the 2017/2018 and 2019 evaluation.

☐ Hypothesis: *planpolitik* change the simulation after 2015/2016 so it is easier and has less explanations.

The Interview Result

Interviewer: In 2015/2016 the participants rated your simulation game as little realistic, in 2017/2018 the value of realism is increasing. But the values of the attributes exhausting, informative, nerve-racking, exciting and too difficult decrease partly very clear. Did you make the simulation game more realistic and a bit „easier" after 2015/2016 or where did the change come from in your opinion?

planpolitik: We have the contents of the slides, so that's going on at every phase of the game, there's the faction phase and the committee phase, and so on, and when these phases start, **there's a pop-up screen that says that's happening now and these are your tasks. We made these shorter and more attractive. So that is now drawings that present these things**

The Knowledge Question

Constructs	2015/2016 Difference in means by Cohen's d	2017/2018 Difference in means Cohen's d	2019 Difference in means Cohen's d
Objective political knowledge	**-.33**	Was not measured	.17
Objective political knowledge EU Parliament	-.13	Was not measured	**.48**
Subjective political knowledge	.02	.03	**.29**

Cohen's d: No Effect > 0.2, Small Effect 0.2 – 0.5, Medium Effect 0.5-0.8, Large Effect < 0.8

The Knowledge Question Hypothesis

- The simulation game had a negative/ no effect on objective knowledge in 2015&2016 and also no effect on subjective knowledge in 2015/2016 and 2017/2018.

- Middle size effect on objective knowledge about the EU Parliament and a small effect on subjective knowledge in the 2019 evaluation.

☐ Hypothesis: After the negative evaluation results *planpolitik* added knowledge creating and saving improvements into the simulation.

Reaction of planpolitik

Interviewer: In the new evaluation there is a small increase in subjective knowledge as well as a middle size increase in objective knowledge about the European Parliament for the first time. Did you use more knowledge elements or better methods to establish knowledge after the evaluations of 2015/2016 and 2017/2018?

planpolitik: We changed nothing in the game itself **but we added a presentation** which the teacher, so the **introduction before the game starts**, there is now a presentation for the teacher which the teacher will show the pupils. Now we are doing an online simulation game. This and that will happen and **that helps to structure the expectations of the pupils and than they know better what is coming for them and what they learning about** and that there is a committee and they are simulating a law making process and just the classification where they are and what they are doing right know. **Before that we just throw them in cold water**. Thereby, I think, it is clearer to the people what they are doing and **than they can better learn and safe the information.**

Structure

- Background

- Aims and Research Questions

- Study Design

- Results

- **Conclusion and Outlook**

Conclusion

- The **evaluation sparked change** in the chat system and the final voting system which led to positive results in later evaluations

- Through the evaluations **it was possible to identify changes in the simulation game** regarding the difficulty and the role description

- **Negative evaluation results fostered further adjustments** for creating and saving knowledge

- Overall the evaluations were a valid part for improving the simulation game.

Conclusion Improvements/Deteriorations

- **Chat System**: New push service for real time communication to show new messages from other players☐ very positive assessment of the improvement

- **Final Vote/End Result**: Sentence building blocks as drop down options instead of writing and voting one's own final declaration/text ☐ very positive assessment of the improvement

- **Knowledge Elements**: Presentation to prepare participants and to help them structure their learning process☐ Higher learning outcome

- **Role Identification**: Interactive creating a role instead of plain text☐ higher role Identification but less information

- **Task/Explanations**: Changing from written tasks to drawings for an easier understanding ☐ Less difficulty/exiting/interesting and complains about a lack of explanations

Outlook

- Simulation game renewed for 10 more games in 2019/2020 but fewer schools participate

- Ongoing study with an updated version for 2020 and a new topic plastic waste

- Overall the simulation game has weak results in the evaluations ☐ *planpolitik* is planning for blended learning with apps in the future

Backup

The Time Management

What did you not like about the simulation game?						
	2015/2016		2017/2018		2019	
Category	Mention	Percent	Mention	Percent	Mention	Percent
Lack of explanations			21	**25,3%**	11	**13.9%**
Time management/ brevity of the game	21	**28,8%**	17	**20,5%**	14	**17.7%**
End of the game/ final vote	3	4,1%	14	**16,9%**		
Problems with the behavior of other players	8	11%	13	15,7%	13	16.5%
Technical problems	17	**23,3%**	7	**8,4%**	13	**16.5%**
Too long/ long waiting times			3	3,6%	7	8.9%
Design of the game					9	11.4%
Other	5	6,8%	8	9,6%	8	10.1%
Length of the survey/ questionnaire	19	26%				
Overall	73	100%	83	100%	79	100%

The Time Management

Interviewer: The evaluation indicates another problem, the time management. This is gradually improving with each new evaluation, did you work on that and if so was the evaluation the reason why you did that?

planpolitik: We did not change the technical functions. Maybe we took away or extended it a minute or two here and there . The change of the phases is minimal. What changed is (...), that I call the teacher before and explain the matter just a bit more accurate and I can imagine that the teacher better understand how the simulation works and will pass that on to the pupils.

Constructs	2015/2016 Difference in means by Cohen's d	2017/2018 Difference in means Cohen's d	2019 Difference in means Cohen's d
Objective political knowledge	**-.33**	Was not measured	.17
Objective political knowledge EU Parliament	-.13	Was not measured	**.48**
Subjective political knowledge	.02	.03	**.29**

category	2015/2016		2017/2018		2019	
	Mean	Cohens'd to 2017/2018	Mean	Cohens'd to 2019	Mean	Cohens'd to 2015/2016
interesting	2.97	**-.20**	2.82	**.27**	3.00	.04
diversified	2.79	**-.22**	2.61	**.20**	2.76	-.04
informative	2.78	**-.46**	2.43	**.56**	2.82	.06
exciting	2.76	**-.29**	2.53	.06	2.57	**-.27**
exhausting	2.47	**-.69**	1.93	**.51**	2.27	**-.28**
too short	2.46	-.08	2.38	-.16	2.24	**-.25**
nerve-racking	2.40	**-.37**	2.07	**.26**	2.29	-.12
realistic	2.32	**.32**	2.57	.09	2.63	**.40**
too superficial	2.29	-.10	2.21	**.29**	2.43	.18
too easy	2.05	-.04	2.02	.15	2.11	.09
boring	2.02	.11	2.11	0	2.11	.12
too long	1.76	-.11	1.68	**.40**	1.96	**.28**

category	2015/2016		2017/2018		2019	
	Mean	Cohens' d to 2017/2018	Mean	Cohens' d to 2019	Mean	Cohens's to 2015/2016
Prepartion phase of the simulation	2,98	-.13	2,88	-.15	2,79	**-.33**
Layout of the simulation	3,31	**-.26**	3,14	.05	3,17	-.21
Desription of your role	3,19	-.12	3,10	-.09	3,04	-.20
Work instructions	2,99	**-.27**	2,79	.08	2,85	-.16
Time management	2,67	-.12	2,57	-.09	2,50	**-.22**
Technical features general	2,83	.01	2,84	-.06	2,80	-.04
Technical features of the chat	2,75	**.31**	3,02	.07	3,07	**.38**
Communication by chat	2,67	**.45**	3,06	-.25	2,87	**.22**
Results of the simulation	2,50	-.17	2,33	**.54**	2,79	**.32**

What did you like about the simulation game?						
	2015/16		**2017/18**		**2019**	
Category	Mention	Percent	Mention	Percent	Mention	Percent
Communication with each other	21	38,1%	35	42,6%	27	29.7%
Role identification	5	**9,1%**	14	**17,1%**	15	**16.5%**
Insight into politics/EU/legislation	10	18,2%	9	11%	15	16.5%
Diversity	3	5,5%	7	8,5%	3	3.3%
Digital learning			3	3,7%	1	1.1%
Design and layout of the simulation game	12	21,8%			11	12.1%
Chat functions					8	**8.8%**
(End-)Voting in the game					2	2.2%
Others	4	7,3%	14	17,1%	9	9.9%
Overall	55	100%	82	100%	91	100%

What did you not like about the simulation game?						
	2015/2016		**2017/2018**		**2019**	
Category	**Mention**	**Percent**	**Mention**	**Percent**	**Mention**	**Percent**
Lack of explanations			21	**25,3%**	11	**13.9%**
Time management/ brevity of the game	21	**28,8%**	17	**20,5%**	14	**17.7%**
End of the game/ final vote	3	4,1%	14	**16,9%**		
Problems with the behavior of other players	8	11%	13	15,7%	13	16.5%
Technical problems	17	**23,3%**	7	**8,4%**	13	**16.5%**
Too long/ long waiting times			3	3,6%	7	8.9%
Design of the game					9	11.4%
Other	5	6,8%	8	9,6%	8	10.1%
Length of the survey/ questionnaire	19	26%				
Overall	73	100%	83	100%	79	100%

What would make the simulation game better?						
	2015/2016		2017/2018		2019	
Category	Mention	Percent	Mention	Percent	Mention	Percent
More detailed explanations of the roles and tasks	8	10,7%	23	27,1%	14	21.2%
More time	21	28%	15	17,6%	11	16.9%
Fix technical errors	25	**33,3%**	10	**11,8%**	3	**4.6%**
Expand structures/personnel	8	10,7%	10	11,8%	11	16.9%
Better (final) voting options			4	**4,7%**		
Less time/ shorter waiting time			3	**3,5%**	8	**12.3%**
Clearer Design	3	4			1	1.5%
Not so many emails					4	**6.2%**
No suggestions for improvement					4	6.2%
Other	10	13,3%	5	5,9%	9	13.8%
Overall	75	100%	85	100%	65	100%