



Department Business

Berner Fachhochschule
Haute école spécialisée bernoise
Bern University of Applied Sciences

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May 26, 2024 to May 30, 2024 - Barcelona, Spain



Digital Peer Grading in Group Learning: Empirical Insights and Best Practices

Agenda:

- Context: Group Work (not only in Higher Education)
- Peer Grading and PGT Online Tool
- Experiences & Good Practice

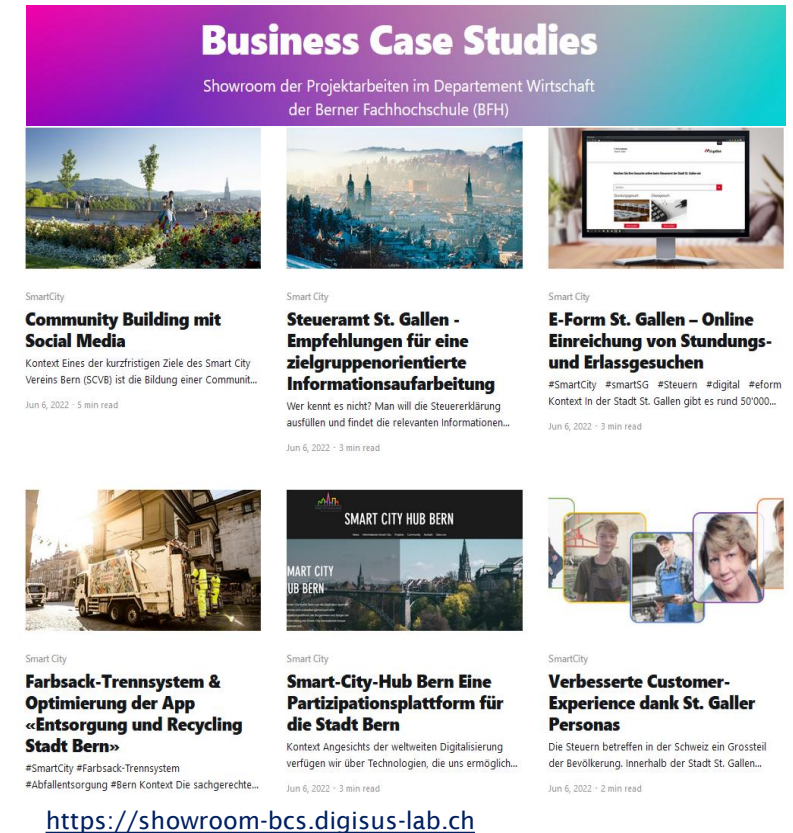
Authors:

- Eduard Klein
- Claus Noppene

Initial Situation for Peer Grading

- ▶ Use of group work to enable problem-oriented learning and prepare for agile working environments.
- ▶ Students work in groups in a largely self-organized manner
- ▶ Lecturers provide support in a coaching role
- ▶ Free riding and overperformer as a challenge in group work (fair assessment, motivation in the group)
- ▶ Common group mark for deliverables as a rule with the option of individualization through Peer Grading results
- ▶ Peer Grading vs. Peer Assessment, Peer Rating, Peer Evaluation,...
- ▶ Peer Grading Tool PGT supports and facilitates collection of peer grades, calculations and communication of results

Application in Study Module:



Business Case Studies
Showroom der Projektarbeiten im Departement Wirtschaft der Berner Fachhochschule (BFH)

Community Building mit Social Media
Kontext Eines der kurzfristigen Ziele des Smart City Vereins Bern (SCVB) ist die Bildung einer Communit...
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Steueramt St. Gallen - Empfehlungen für eine zielgruppenorientierte Informationsaufarbeitung
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#SmartCity #smartsG #Steuern #digital #reform
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Kontext Angesichts der weltweiten Digitalisierung verfügen wir über Technologien, die uns ermöglicht...
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Verbesserte Customer-Experience dank St. Galler Personas
Die Steuern betreffen in der Schweiz ein Grossteil der Bevölkerung. Innerhalb der Stadt St. Gallen...
Jun 6, 2022 · 2 min read

<https://showroom-bcs.digisus-lab.ch>

Peer Grading Tool – PGT

- ▶ Developed and in use since January 2023 (implemented in *Angular*)
- ▶ Successor of Excel-based prototype (since 2021)

Peer grading form for Everdeen Katniss

campaign name: Project Management Lecture 2024
group number: 1
group size: 4
grading scale: 1 - 8
campaign start: Jan 31, 2024

criterion (weight)	Teamworking skills (1)	Quality (1)	Quantity (1)	Reliability (1)	average
Klein Eduard	<input type="text" value="8"/>	<input type="text" value="3"/>	<input type="text" value="7"/>	<input type="text" value="4"/>	5.5
Dent Arthur	<input type="text" value="4"/>	<input type="text" value="3"/>	<input type="text" value="4"/>	<input type="text" value="8"/>	4.75
Everdeen Katniss	<input type="text" value="3"/>	<input type="text" value="8"/>	<input type="text" value="6"/>	<input type="text" value="7"/>	6
Parsons James Joseph	<input type="text" value="3"/>	<input type="text" value="8"/>	<input type="text" value="8"/>	<input type="text" value="4"/>	5.75

comments
comment for Arthur Dent

- ▶ participants receive an individualized link to the peer grading form via e-mail
- ▶ Set-up: Number, naming, and weighting of criteria initially definable
- ▶ Evaluation:
 - ▶ for each participant --> mail to student
 - ▶ for all groups --> mail to lecturer
- ▶ Choice: peer grading results can be used with or without influence on the students' marks



<http://www.bfh.ch/peer-grading-tool>

Open Source:
<https://github.com/digital-sustainability-lab/peer-grading-tool-mirror>

PGT Evaluations - example

Peer grading evaluation for Everdeen Katniss from Apr 2, 2024

campaign name: Project Management Lecture 2024
 group number: 1
 group size: 4
 grading scale: 1 - 8
 campaign period: Jan 31, 2024 - Feb 3, 2024

criteria (weighting):
 Teamworking skills (1)
 Quality (1)
 Quantity (1)
 Reliability (1)

	Teamworking skills (1)	Quality (1)	Quantity (1)	Reliability (1)	average
peer assessment	3.67	3.67	5	4.33	4.17
self assessment	3	8	6	7	6

4.17

peer assessment ⓘ

4.81

group average ⓘ

-0.64

deviation ⓘ

comments recieved

author	comment
Arthur Dent	Working with you was great.
James Joseph Parsons	It was a pleasure.

overview of group 1

grading from \ grading of	Klein Eduard	Dent Arthur	Everdeen Katniss	Parsons Jam
Klein Eduard	4.25	2	3	6.5
Dent Arthur	4.25	2.75	5.5	5.25
Everdeen Katniss	5.5	4.75	6	5.75
Parsons James Joseph	6	5.25	4	4.25
peer grading average: ⓘ	5.25	4	4.17	5.83

comments from Arthur Dent:
 for Eduard Klein:
 i was quite isolated in this group
 for Katniss Everdeen:
 Working with you was great.

comments from Katniss Everdeen:
 for Eduard Klein:
 such a cool group!
 for Arthur Dent:
 well done!

comments from James Joseph Parsons:
 for Eduard Klein:
 the team building pub crawl event was super cool!
 for Katniss Everdeen:
 It was a pleasure.

Individual evaluation for each student

Overview per group for each lecturer

PGT – Kampagne erstellen

Peer Grading Tool login

EN [? about](#)

e-mail:

password:

Peer Grading Tool PGT [← Back to Login](#)

Note: If you are interested in using PGT, the tool's self-registration feature can be used. In case of questions, please contact the author (see below).

[Version Information](#)

1 General

In group work, ideally all members contribute equally to the overall success of the project, but usually in individually different ways. Peer grading is used to evaluate individual contributions in group work ([Kaufman et.al. 1999], [Brutus & Donia 2010]), in our context the online tool PGT is used for this purpose. Each group member grades all other group members (peer grading) as well as himself/herself (self-grading) according to definable

edit campaign

in general

campaign name:

maximum number of points per criterion:

language:

status:

created on:

grading criteria

name of criterion:

weighting:

name	weighting	
Teamworking skills	1	<input type="button" value="delete"/>
Quality	1	<input type="button" value="delete"/>
Quantity	1	<input type="button" value="delete"/>
Reliability	1	<input type="button" value="delete"/>

overview of group

number	number of participants	
1	4	<input type="button" value="delete"/>
2	3	<input type="button" value="delete"/>

group 1

group 2

PGT – Importing Groups / Group Members

Name	Vorname	Matrikel-Nr.	Mail	Gruppe
Haller	Stephan	22-345-678	stephan.haller@bfh.ch	1
Harder	Deane	33-456-789	deane.harder@bfh.ch	1
Klein	Eduard	44-567-890	eduard.klein@bfh.ch	1
Noppeney	Claus	55-678-901	claus.noppeney@bfh.ch	2
Müller	Susan	66-789-012	susan.mueller@bfh.ch	2
Hillebrand	Kirsten	77-890-123	kirsten.hillebrand@bfh.ch	2
Jud	Reto	88-901-234	reto.jud@bfh.ch	1

edit campaign

in general

campaign name:

maximum number of points per criterion:

language:

status:

created on:

grading criteria

name of criterion:

weighting:

[+ add](#)

name	weighting	
Teamworking skills	1	delete
Quality	1	delete
Quantity	1	delete
Reliability	1	delete

overview of group

[download template](#) [import list of participants](#) [new group](#)

number	number of participants	
1	4	delete
2	3	delete

group 1 [delete group](#)

group 2 [delete group](#)

[save](#)

```
Name, Vorname, Matrikel-Nr., Mail, Gruppe
Haller, Stephan, 22-345-678, stephan.haller@bfh.ch, 1
Harder, Deane, 33-456-789, deane.harder@bfh.ch, 1
Klein, Eduard, 44-567-890, eduard.klein@bfh.ch, 1
Noppeney, Claus, 55-678-901, claus.noppeney@bfh.ch, 2
Müller, Susan, 66-789-012, susan.mueller@bfh.ch, 2
Hillebrand, Kirsten, 77-890-123, kirsten.hillebrand@bfh.ch, 2
Jud, Reto, 88-901-234, reto.jud@bfh.ch, 1
```

Save in CSV format (UTF-8)

Matrikel-Nr. is optional

group 1 [delete group](#)

[add person](#)

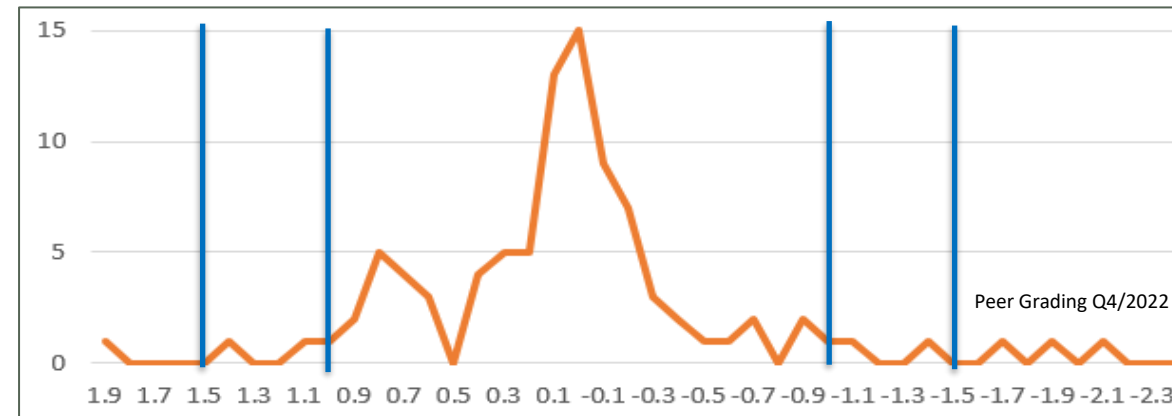
first name	last name	matriculation number (optional)	e-mail	
Stephan	Haller	22-345-678	stephan.haller@bfh.ch	delete
Deane	Harder	33-456-789	deane.harder@bfh.ch	delete
Eduard	Klein	44-567-890	eduard.klein@bfh.ch	delete
Reto	Jud	88-901-234	reto.jud@bfh.ch	delete

Peer Grading – Experiences / Study Course "Business Case Studies"

- ▶ Observation Period
Q4/2021 – Q2/2023

	HS21	FS22	HS22	FS23
# students	62	122	94	149
# groups	12	24	19	30
# stud-per-grp	5.17	5.08	4.95	4.97

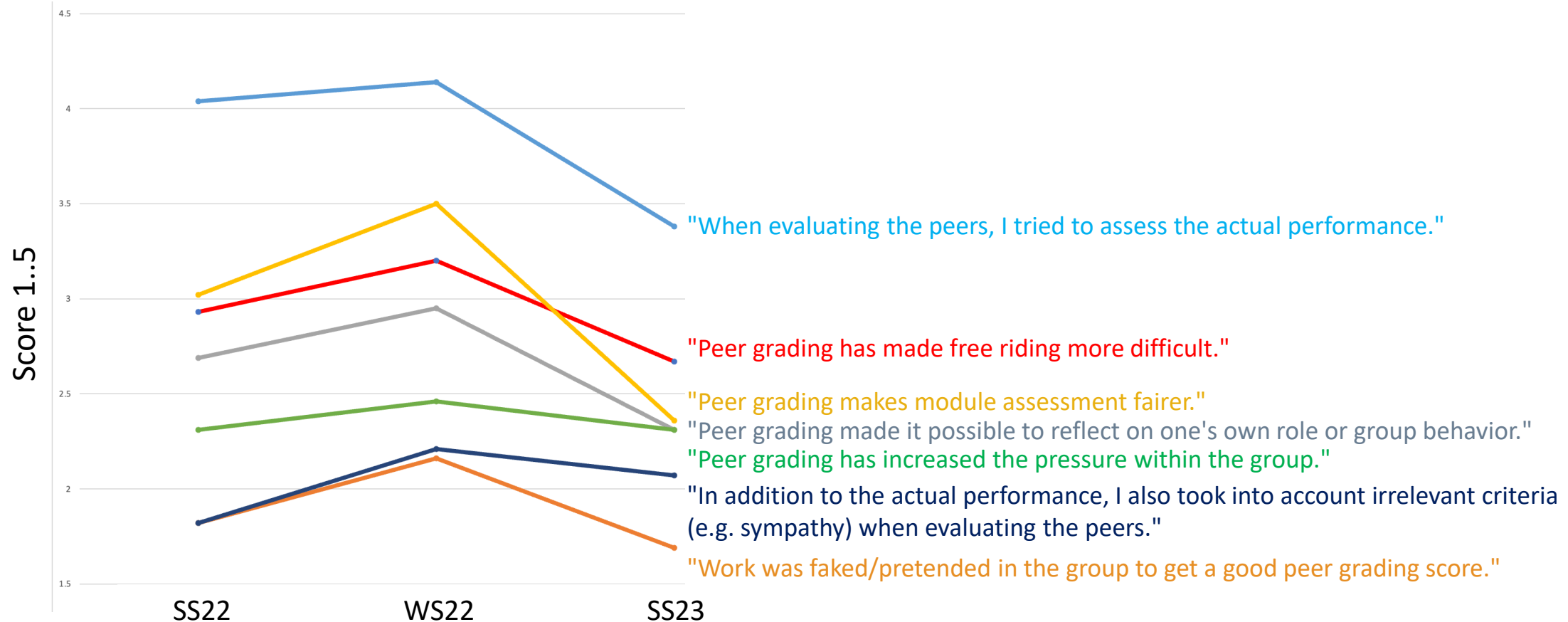
- ▶ Definition of threshold values, if relevant for students' marks



- ▶ Observations:
 - ▶ rarely: high individual deviations (below 5%)
 - ▶ No group-related discrimination (degree program, gender, study model)
 - ▶ Relevance for marks does not influence peer grading
 - ▶ Increased variance of individual deviations with full time study model
 - ▶ Partly group-internal agreements (identical evaluations)
 - ▶ Recommendation: Compare free rider evaluations with own (coach) impression!

Peer Grading – Follow Up Surveys with Students / Results

"Please indicate how much you agree with the following statements on peer grading":



Learnings from Follow Up Surveys

1. On average, group work with peer grading was judged to be comparable or even **better than other group work** at our university.
2. Students recognize that peer grading makes **freeriding more difficult**. However, this effect also mobilizes critical voices.
3. In the surveys, a **hard core** of approx. 10-25% reject any further use of peer grading, which can have an overall impact on the experience of the module.
4. In contrast, approx. **75-90% are in favor of the continued use** of peer grading at our university. The distribution of the surveyed frequencies (rarely, occasionally, often, always) varies considerably depending on the study course.
5. 7-13% of students are in favor of using **peer grading for all group work** at our university.

Recommendations for the use of Peer Grading

- ▶ The context seems **appropriate**:
 - ▶ The larger the group
 - ▶ The less the group members know each other
 - ▶ The more heterogeneous the group
 - ▶ The less voluntarily the group is composed
 - ▶ The more intensively and self-organized the students are expected to work together
 - ▶ The stronger the feedback culture is lived in the degree program
- ▶ Pay Attention!
 - ▶ Without a feedback culture, peer grading can mobilize negative energies
 - ▶ Lecturers can be encouraged to give better grades in order to avoid critical discussions about the module grade

Project "DigiPeG" – Digital Peer Grading

- ▶ Research question: **"How can digital peer grading promote learning in group work?"**
- ▶ Accompanying scientific research
 - ▶ <https://belearn.swiss/en/projekt/digipeg-digitales-peer-grading-fuer-lernfoerdernde-gruppenarbeiten/>
- ▶ Evaluation catalog for participants and lecturers (Qualtrics Surveys)
- ▶ Derivation of recommendations for action (best practices)
- ▶ Use of "Peer Grading Tool" PGT
 - ▶ Publicly available online (implemented in Angular)
 - ▶ Open source (Github)



Prof. Dr. Eduard Klein

<https://www.bfh.ch/de/eduard-klein>

Institut Public Sector Transformation
Study Program: Business Informatics



Prof. Dr. Claus Noppene

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Institut Innovation and Entrepreneurship
Study Program: Business & Economics

Use of Peer Grading Tool PGT

- ▶ Publicly available
 - ▶ <http://www.bfh.ch/peer-grading-tool>
- ▶ Self-registration possible
- ▶ "Help Desk" in tool use (eduard.klein@bfh.ch)
- ▶ Follow up survey available
- ▶ Open source
 - ▶ <https://github.com/digital-sustainability-lab/peer-grading-tool-mirror>



Questions ?

