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# Students' View on Instant Online Feedback for Presentations

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# Students' View on Instant Online Feedback for Presentations

## ABSTRACT

This paper presents an empirical study investigating the use of instant online feedback on face-to-face presentations. This innovative way of using information technology for the specific communication purpose of giving feedback was researched in the context of a university course on “Human-Computer Interaction and Psychology”. A total sum of 80 students majoring in Computer Science participated in the instant online feedback activity and 907 feedbacks were given. 72 students returned the questionnaire for evaluating this educational scenario. Quantitative and qualitative analysis revealed that students seem to prefer giving feedback online in addition to a face-to-face setting for reasons like possible anonymity and more honesty. Study results further demonstrate that instant online feedback may facilitate students' interest in and commitment to their presentations, finally also increasing their contributions' quality.

## Keywords

Interactive Technology Enhanced Learning, Feedback, Computer Mediated Communication.

## INTRODUCTION

Presentations are a pedagogical element widely used in the context of information systems education. Especially in laboratory courses and seminars, students usually have to present their projects or seminar papers individually or in teams. Typically, these presentations do not only serve as a basis to assess students' learning but are used as a pedagogical means to drive student's commitment, finally inducing better learning outcomes. Providing appropriate feedback (in particular context frequently also referred to as formative assessment) is thereby a key element that allows students to improve their performance based on the insights gained from the received information.

A central concern in this paper is to investigate students' perception of instant online feedback activities, particularly with respect to appropriate media choice and feedback timing. We present the design and results of an empirical study with computer science students in a course on “Human-Computer Interaction and Psychology”.

The paper is structured as follows. First we give a short overview about background and applications of feedback in the educational context with particular emphasis on its formative assessment character. The second section is dedicated to the empirical part of the study, which includes the research questions, research design, methods, a description of the course context, as well as the results of the study. The final section concludes with a summary and outlook on future research.

## THEORETICAL BACKGROUND

In the educational context, feedback is widely researched in various settings. Although (Butler & Winne, 1995; Kulik & Kulik, 1988; Mory, 2004) stick to the term “feedback”, they emphasize the formative aspect of this pedagogical element. (Bhalerao & Ward, 2001; Black & William, 1998; Boston, 2002; Buchanan, 2000; Chinn, 2005; Dochy, Segers, & Sluijsmans, 1999; Orsmond, Merry, & Callaghan, 2004; Sitthiworachart & Joy, 2003; Trahasch, 2004; Wang, Wang, Wang, & Huang, 2006) prefer the term “assessment”.

### Assessment

The term *assessment* refers to all means for gathering information about student performance and encompasses, for instance, teacher observation or analysis of student work, like assignments and tests (Boston, 2002). While *summative assessment* is used to measure what students have learned at the end of some period of instruction (e.g. by grading a test) to ensure that they have met required standards (Boston, 2002). *Formative assessment*, in contrast, refers to the feedback process that uses information about students' performance to close the gap between students' current state and the desired learning state. If

students have received feedback on their performances, they may then undertake activities to remedy whatever weaknesses the assessment has exposed. Briefly put, assessments become formative, when feedback is used to adjust teaching and learning appropriately to meet students' actual needs (Black & William, 1998; Boston, 2002).

### **Feedback in Educational Context**

Discussion has progressed without a formal definition of feedback. In the educational context, feedback can be said to describe any communication given to inform a learner of the accuracy of a response (Kulhavy, 1977). Thereby, feedback in instruction might not only refer to answer correctness but may include information on other issues such as precision, timeliness, learning guidance, motivational messages, or critical comparisons (Mory, 2004).

The underlying propositions of the early threads of feedback research, dating back to the early 1900s, still prevail in the views of feedback we currently hold. First, feedback served as a motivator or incentive intended to increase the response rate and accuracy. Second, feedback was used as a reinforcing message; the focus, thus, laid on correct responses. Finally, feedback provided information that learners could use to validate or change (correct) previous responses; here the focus of feedback fell on error responses (Mory, 2004).

Interestingly, most studies that have examined feedback in an educational context, investigate situations where feedback is given after a learner responds to a question during instruction (Mory, 2004). In contrast, (Butler & Winne, 1995) have suggested that viewing feedback in such a one-sided context fails to consider variances in student behavior that might be result of self-regulation. Thus, we view feedback in a broader sense and use the term *feedback* to describe any of the numerous procedures that are used to inform a learner about his or her performance.

Concerning feedback timing, (Kulik & Kulik, 1988) provide a thorough review of 53 independent studies on this topic. Particularly important for our study is the finding – that also concludes in (Kulhavy, 1977) – that delayed feedback typically hinders learning. Delaying feedback appears to help learning only in special experimental situations; but even in such experiments immediate feedback yields better effects than delayed feedback does. With increasing popularity of e-learning settings, the term *instant feedback* was however frequently associated with (online and/or multiple choice) tests that are not used for grading but allow students to self-assess their current knowledge, indicating whether they are ready for a later “real” exam (summative assessment) (Bangert-Drowns, Kulik, Kulik, & Morgan, 1991; Buchanan, 2000; Leung & Csete, 2006; Wang et al., 2006). In such scenarios, instant feedback is then provided by a machine, showing a student whether his or her answers on this mock-up test had been correct.

Assessment activities are not limited to educators or technology. Students can be involved in providing feedback on their peers' contributions (Dochy et al., 1999; Orsmond et al., 2004; Trahasch, 2004, p. 16), primarily applied as formative (Trahasch, 2004, p. 16) but also used as summative assessment (van der Pol, van den Berg, Admiraal, & Simons, 2008). In the educational context, such peer feedback has become popular in many disciplines like, for instance, in software engineering (Bauer & Figl, 2006; Figl, Bauer, Mangler, & Motschnig-Pitrik, 2006; Sitthiworachart & Joy, 2003; Trahasch, 2004) or in the social sciences (Ertmer et al., 2007; Orsmond et al., 2004), particularly in writing classes (Coit, 2004; Dochy et al., 1999; Hansen, 2005; Liu & Sadler, 2003; Sullivan & Pratt, 1996; Tuzi, 2004). With respect to technology-enhanced learning, many studies investigated the impact of media (combinations) on reviews or communication and collaboration aspects (Bauer & Figl, 2006; Figl et al., 2006; Hansen, 2005; Huang, 1998; Liu & Sadler, 2003; Sullivan & Pratt, 1996).

Frequently research on peer assessment addresses the reliability and validity of students' comments (Bhalerao & Ward, 2001; Sitthiworachart & Joy, 2003) or focuses on the validity and content of reviews (Derntl, 2006; Dochy et al., 1999; Trahasch, 2004), while only few studies dedicate to peer feedback from a collaborative learning perspective (Figl et al., 2006; Orsmond et al., 2004; van der Pol et al., 2008). This notwithstanding, studies reveal that peer feedback has many benefits on students' learning and discuss the positive effects of peer reviews on students' “generic skills.” The main positive effects include development of evaluation skills, learning to provide feedback accurately and constructively, increasing reflection skills, developing awareness of the quality of own work, learning from peer contributions, and improving own performances (Derntl, 2006; Dochy et al., 1999; Sitthiworachart & Joy, 2003; Trahasch, 2004).

## **EMPIRICAL STUDY**

### **Research Questions**

The main underlying research question of the study is whether it makes a difference giving feedback face-to-face or online. Additionally we aimed at investigating how online feedback can be appropriately applied in an educational context. Following research questions are addressed:

- How do students experience giving and receiving feedback on presentations online?
- Do students prefer giving feedback online or face-to-face?
- What is the most appropriate setting for online feedback in courses?

### Study Context

The study was conducted in the laboratory course “Human-Computer Interaction and Psychology” which was held at the University of ..... in summer term 2008 as part of the computer science curriculum. The course was designed as a technology-enhanced learning course which combined presence course units with online activities. The accompanying e-learning platform included a discussion board, an upload area for the required documents and presentations, an area for online feedback, as well as reaction sheets that allowed students to write general feedback about the course units. The laboratory course was accompanied by a lecture on the basics of Human-Computer Interaction (e.g., relevant parts of cognitive psychology, user interface design principles as well as usability engineering).

Main aim of the laboratory course was to show students that, besides software implementation, the interface design of software also plays an essential role for a product’s success. The laboratory course was held in five blocked units dedicated to develop a design for an application (e.g., interactive television interface, websites, or interface for software) in teams. The goal of the team-projects was that students learn and apply the following basic design steps (Nielsen & Mollich, 1989; Turban, 2003):

- **Brainstorming:** project idea and task as well as audience analysis
- **Practices:** user requirements, personas, and case studies
- **Design:** low and high fidelity prototypes, error messages specification and navigation map
- **Usability Testing:** interviews, observation, and the usability methods “thinking aloud” and “card sorting”

All laboratory courses were held in parallel groups, whereby one instructor was responsible for up to three groups of about 15-20 students. In summer term 2008 altogether 80 students took part in the laboratory course.

In the preliminary discussion the instructors informed students about the course requirements and activities and provided a short introduction to Human-Computer Interaction. Furthermore, students were invited to share their interests and experiences concerning Human-Computer Interaction, which allowed them to get familiar with each other prior to building teams (2-3 persons each). In teams they worked out a project idea, which was approved by the facilitator and presented by each team in the second course unit. Representing the design steps “Brainstorming” and “Practices”, students had to define specific use cases and three to five personas for the projects, which aimed to demonstrate that the primary user and further stakeholders as well as their requirements have to be determined right from the start. In addition to the team projects, students had to find and analyze good as well as bad examples of websites based on usability heuristics (Nielsen, 1993) in an individual task. A proposal on how to improve the chosen bad example was worked out by students and presented individually in class in the third unit.

The third team task reflected the step “Design” and students had to prepare a paper prototype reflecting typical scenarios based on the defined personas. A further exercise was to specify appropriate error messages and define how dialogs could look like. The designs were not explicitly presented in the unit since students should not see their colleagues’ project designs before taking part in the usability test.

For the fourth unit, each teams had to elaborate a detailed concept for a usability test for its project (step “Usability Testing”) and a navigation map to show all possible interconnections. For the usability test, it was required to apply the following methods: interview, user test with different tasks including observations and thinking aloud and card sorting. Students had to change roles in the user test to experience all of them (test leader, test user, protocol writer). Due to the usability test of the prototypes, this unit was very interactive.

In the last unit, teams had to present the results of the usability tests and their suggestions for improvement based on their findings.

**Rationale for Implementing Instant Online Feedback in the Course Design**

Basically, the reasons for incorporating peer feedback in our course design substantiate in the positive effects on learning as had been outlined in the theoretical part of this paper. Beyond, the following aspects offered incentives for the specific implementation:

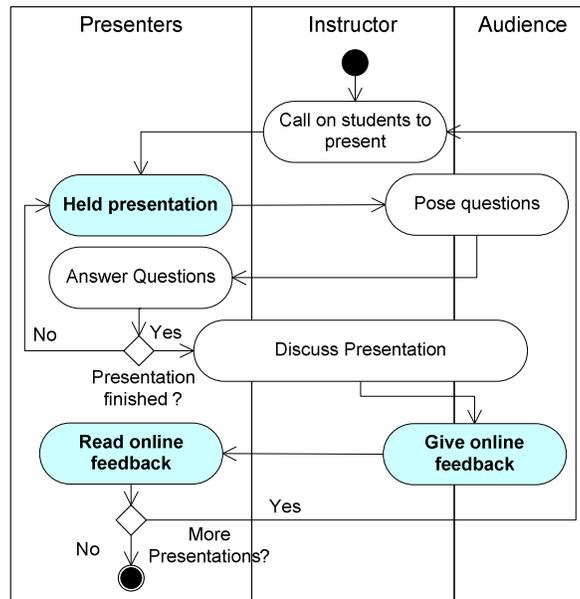
- As student presentations take a main part of the laboratory course, including students in providing feedback on student performances could release educators from some overhead with respect to time required for feedback endeavors.
- As many presentations already take much time of the laboratory course, the time frame dedicated to providing feedback in the course units should be held rather low.
- Experience from our earlier courses demonstrates that students appreciate to receive feedback from their peers. Asking students whether they want to continue using the feedback mechanism, provides information about the appropriateness of the particular implementation in the given context.
- Many students do not dare to give feedback in face-to-face settings, while they provide important insights when they feel “protected”, which particularly holds true for rather large group settings. The establishment of an anonymous setting contributes accordingly to a balanced participation in the feedback process.
- When students are required to provide feedback on presentations, they are very likely to pay attention. However, when students have the possibility to receive feedback immediately before or while other presentations continue, they might be occupied with thinking about the information and would not dedicate to listen to further contributions.

**Interactive Online Feedback for Presentations**

The online feedback scenario was implemented in the

- Second unit: team presentation (~10 minutes) on project idea;
- Third unit: individual presentation (~5 minutes) on usability of bad / good websites.

For both of these presentations a total time slot of approximately two hours was available; thereby 5-8 teams presented in the second unit and 10-20 students in the third unit.



**Figure 1. Activity diagram of online feedback for presentations**

As depicted in Figure 1, main activities of online feedback were holding presentations as well as giving and reading online feedbacks. The instructor called students (teams or individuals) to present in front of class. Presentations usually included slides with beamer and live demonstrations (e.g. of websites). Students and the instructor could interpose questions during presentations and a discussion followed the presentation. Afterwards students anonymously filled out the online feedback form, which was accessible on the accompanying e-learning platform, directly above students' workspaces with uploaded documents (see Figure 2). As soon as feedback forms were filled out, the presenters could immediately see their feedback results. Mean values of ratings were calculated and written comments were listed anonymously. The names of the reviewers were only visible for the instructors to interfere if inappropriate comments or flaming would occur.



**Figure 2. Access to the online feedback form on the e-learning platform**

Altogether 80 students participated in the instant online feedback activity and a total sum of 907 feedbacks was given.

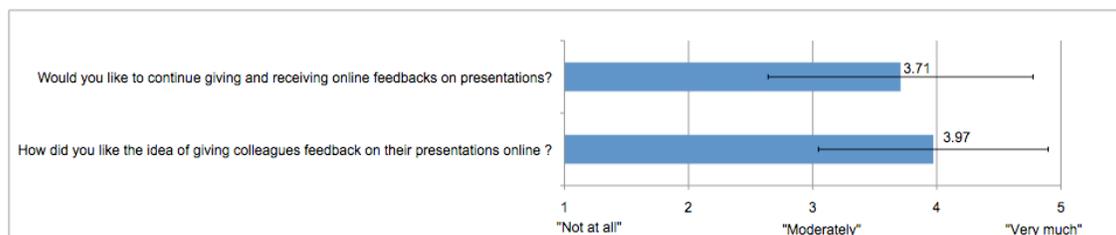
### Study Design and Questionnaire

For evaluating the implemented educational scenario of giving colleagues instant online feedback on their presentations, we used a one-group posthoc-design. We decided to let students fill out the evaluation questionnaire in the last lecture sessions, as it seemed to be easier to motivate all students to participate in the evaluation. The online questionnaire included four five-point Likert-Scale items and two open text fields to allow students to freely express their opinions on advantages and disadvantages of the online feedback. Students were asked whether they appreciate the idea of giving instant online feedback and whether they would want to continue using this method in further course units. Additionally, they were asked if they would prefer giving feedback orally instead of online and which point of time they would regard as appropriate for receiving the feedback.

We applied qualitative content analysis to evaluate students' reflections (Mayring, 1983/2003). The classification scheme was developed inductively from raw data. Categorization was undertaken by two researchers in order to increase inter-subjectivity. As more than 90% allocations to categories and judgments were consistent, the inter-rater reliability was high.

### Results and Discussion

72 students (90%) filled out the online questionnaire for the evaluation of this educational scenario. As depicted in Figure 3 students generally liked the online feedback activity; their ratings varied from "moderately" to "very much" (Mean=3.97, SD=0.93) and most students wanted to continue with the online feedback activity in class (Mean=3.71, SD=1.07).



**Figure 3. Students' attitude to online feedback (n=71).**

Figure 4 shows that students prefer giving feedback online in writing instead of orally (Mean=2.49, SD=1.24). Students' preference for the optimal point of time for receiving feedback is, though, not that clear (Mean=3.12, SD=1.41); maybe this factor is less relevant. While some students want to look at the results of their feedback right after their presentation, others prefer to wait until everybody has presented.

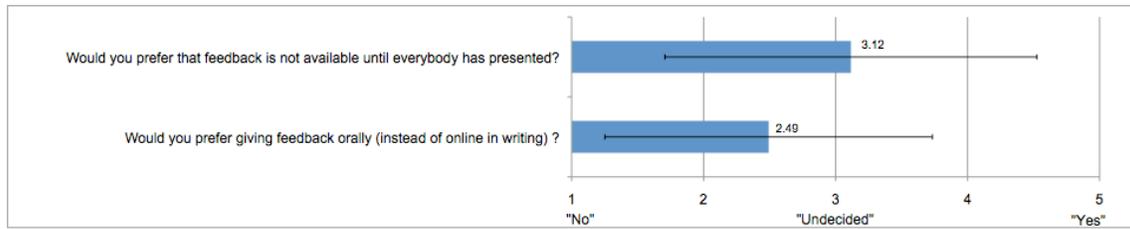


Figure 4. Students' preferences for the feedback setting (n=72).

#### Advantages and Disadvantages of Instant Online Feedback

In the qualitative part of the questionnaire 35 students answered the question "What did you like about the online feedback?" and 25 students responded to the question "What didn't you like about the online feedback?" (**Fehler! Verweisquelle konnte nicht gefunden werden.**). Most comments by students were written about the difference to face-to-face feedback (41 nominations) and implementation issues of the online feedback setting (37 nominations). Additionally students mentioned that getting feedback on their presentations was of value for them (9 nominations). One student, for instance, stated: "You rarely get feedback particularly on your presentation style, that's why I think the idea and the implementation are of great value." Other students also reported that they liked the idea: "It is another form of feedback that we have not used yet in other courses... I think it is a good idea."

Table 1. Qualitative analysis of the evaluation questionnaire about online feedback

	Total number of nominations
<b>Difference to face-to-face feedback</b>	
Anonymity	14
Privacy: only oneself and team members can see the feedback	1
Honesty due to online modus	8
More feedback from everybody	6
Permanence	3
Face-to-face feedback and discussion would be more meaningful	2
Single nominations: need of writing a lot, no discussions, depersonalization	
<b>Implementation issues of online feedback</b>	
<b>Feedback form</b>	
Open text format	10
Fast and uncomplicated	4
Hints for improvement of feedback form	4
Not too many questions	3
Difficulty to judge quality on a scale	2
<b>Feedback on whole teams instead of individual feedback is problematic</b>	4
<b>Reference values for comparison with others/ other teams would be useful</b>	4
<b>Point of time for feedback</b>	
Immediacy of feedback is positive	2
Feedback would be better retrospective after a unit	2
Giving feedback before presentation is over doesn't make sense	1
<b>Helpfulness of receiving feedback in general</b>	9
<b>The use of online feedback on presentations was an innovative and good idea</b>	3

Students indicated that anonymity of giving and receiving feedback was a great advantage of the online feedback (14 statements), e.g. "Everybody has a heart to say more because it is anonymous. That is why more precise points are mentioned, indicating what was done wrong and better constructive critics." Eight students particularly emphasized that the

online setting arouses honesty: *“The miraculous honesty. The courageousness to praise others :-)”*, *“The advantage of online-feedback is [...] that it is possible to broach issues that may be misinterpreted in oral settings or that are not that important to pipe up.”* and *“An honest way to give and to receive feedback. Oral feedback among colleagues is often limited to ‘Sure, it was great’ – but this is not really helpful because you do not learn anything since you do not know what you do wrong.”* Moreover, students mentioned that in the online setting more students would give feedback compared to an oral setting (6 nominations) and feedback gets stored for reading and using it later on (3 nominations; e.g. *“I especially liked that one can see the opinion of everybody else on one’s own work”*, *“everybody gives feedback, one can read it again later on unhurriedly.”*)

Interestingly, only few students referred to drawbacks of the online version and each negative issue raised was mentioned only once (e.g., missing discussions, the need to write a lot, and depersonalization).

#### *Evaluation of the Specific Implementation of Instant Online Feedback*

Concerning the specific implementation of the online feedback students appreciated the possibility for open text comments (10 nominations). Particularly they argue that it is difficult to judge the quality of presentations on a scale from one to five (2 nominations, e.g.: *“It is quite difficult to judge quality on a quantitative scale. Therefore open text fields should definitely always be part of [the feedback form].”*). Additionally, they liked the fact that there were not too many questions to answer (3 nominations) and that providing feedback was fast and uncomplicated (4 nominations). Some students indicated that it is more meaningful to provide feedback for individuals rather than teams even for team settings (4 nominations; e.g. *“Maybe it would be better to give feedback for every person individually because each team member presents differently.”*).

As an important issue, students indicated that they would like to set their received feedback in relation to the other teams (4 nominations; e.g. *“Currently, one can only see one’s own feedback results - a comparison with other teams would, though, be necessary to classify the result.”*

Concerning the appropriate point of time for receiving and writing feedback, students generally mentioned that they liked it that feedback was written and received immediately after the respective presentation (2 nominations; e.g. *“By giving feedback immediately after a presentation, one can better remember point that were good or bad.”*). Additionally, one student explained in the evaluation questionnaire that some colleagues already filled out feedback forms during a presentation. Although this was neither explicitly intended in the course design nor especially prevented, this form of instant feedback (in its very meaning) may be a worthwhile scenario to investigate in upcoming courses.

## **CONCLUSION**

In this paper, we presented a case study in a laboratory course on “Human-Computer Interaction and Psychology” which was held at the University of ..... in summer term 2008 as part of the computer science curriculum. In the course, students held presentations and peers could provide feedback instantly with an online tool.

Results demonstrate that students liked the idea and implementation of the instant online feedback. It is good advice to ask students whether they want to continue using such an implementation in order to make sure that it is appreciated in the specific setting the particular students. In our course students steadily demonstrated their appreciation for instant online feedback.

In particular, anonymity seems to be a big issue. Students affirmed our assumption that more students will participate in anonymous settings and feedback will be more honest and constructive. The possibility for an anonymous implementation is thus a clear advantage of an online setting compared to oral face-to-face feedback. However, the implementation has to ensure anonymity and prevent violation. Furthermore, students have to trust the anonymous implementation; otherwise they will behave as they would in non-anonymous settings. The instructor’s authenticity and credibility is crucial.

In our implementation, feedback had been anonymous among students, while the instructors could see the reviewer’s names. Main reason for this transparency for instructors had been to prevent flaming. It would, however, be interesting to research a setting where feedback is absolutely anonymous – also for instructors. Probably our concerns regarding flaming are unsubstantiated. Maybe it would also positively contribute to a collegial climate if instructors indicate clearly that they support the completely anonymous setting due to trusting their students that they would not misuse anonymity for flaming and the like.

Concerning the optimal point of time for receiving feedback, students’ answers had been heterogeneous. Maybe the timing aspect is not that important or preferences are clearly subjective depending on a student’s character or learning style. For the

latter case, it would be a good idea to allow for personalization such that students can choose whether the tool provides access to feedback immediately or not until all presentations are completed.

With respect to the feedback form, student responses provided meaningful insights that are, though, challenging concerning the appropriate implementation. On the one hand, students highly appreciate that the forms are rather short as well as easily and quickly to fill out. On the other hand, they indicate that it is not easy to express a presentations quality in scales as free text comments would be more informative and constructive. It is, however, apparent that it is essentially the Likert-style answering format that makes the form easily and quickly to fill out while a higher number of open format questions would prolong the feedback process. The ideal proportion of questions with rating scales and free text answering format is, hence, yet to find.

At all events we will heed our students' advice that it is more appropriate to provide feedback for each student individually even for team presentations since the individual presentation styles and skills vary and, thus, feedback will be different for each student.

While our implementation intended to provide feedback after a presentation, students came up with the idea to fill out the feedback forms during the respective presentation. This very form of *instant* feedback seems to have advantages concerning the immediacy to the "source" of feedback but may have drawbacks with respect to decreasing attention in the ongoing presentation. It is, in any case, worthwhile to investigate the impacts of scheduling the feedback activity to the motivation of the moment.

Despite these interesting findings, our study has clear limitations concerning the novelty aspect. We cannot neglect that our implementation may arouse students' interest and motivation because this educational setting is new to them. Some students indeed emphasized that they liked the idea as they have never experienced something similar in other courses before. Only time will show if students' interest and appreciation declines with repeated application of such an educational design.

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