Instant Online Feedback for Oral Presentations

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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. 67 students returned the questionnaire for evaluating this educational scenario. Quantitative and qualitative analysis revealed, that even though being in a face-to-face setting, students seem to prefer giving feedback online compared to orally for reasons like possible anonymity and more honesty. Possibly negative effects like reduced social inhibition in giving online feedbacks due to the anonymity were not observed. 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. Typically, these presentations do not only serve as a basis to assess students' learning but are used as a pedagogical means to drive commitment, finally inducing better learning outcomes. Proving 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. The second section is dedicated to the empirical part of the study, which includes the research questions, methodology, research design, a description of the study 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 and Winne, 1995; Kulik and Kulik, 1988; Mory, 2004) stick to the term "feedback", they emphasize the formative aspect of this pedagogical element. (Bhalerao and Ward, 2001; Black and William, 1998; Boston, 2002; Buchanan, 2000; Dochy, Segers and Sluijsmans, 1999; Orsmond, Merry and Callaghan, 2004; Sitthiworachart and Joy, 2003; Trahasch, 2004; Wang, Wang, Wang and Huang, 2006) prefer the term "assessment".

Feedback in Educational Context

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 et al., 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 et al., 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 (Bangert-Drowns, Kulik, Kulik and Morgan, 1991; Buchanan, 2000; Leung and 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, however, 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 and Simons, 2008). In the educational context, such peer feedback has become popular in many disciplines like, for instance, in software engineering (Bauer and Figl, 2006; Figl, Bauer, Mangler and Motschnig-Pitrik, 2006; Sitthiworachart et al., 2003; Trahasch, 2004) or in the social sciences (Ertmer, Richardson, Belland, Camin, Connolly, Coulthard, Lei and Mong, 2007; Orsmond et al., 2004), particularly in writing classes (Coit, 2004; Dochy et al., 1999; Hansen, 2005; Liu and Sadler, 2003; Sullivan and 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 et al., 2006; Figl et al., 2006; Hansen, 2005; Huang, 1998; Liu et al., 2003; Sullivan et al., 1996).

Frequently research on peer assessment addresses the reliability and validity of students' comments (Bhalerao et al., 2001; Sitthiworachart et al., 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." 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 et al., 2003; Trahasch, 2004).

Media Use for Feedback

Oral feedback is regularly used in educational settings. When using online feedback, media theories in the context of computer-mediated communication have to be taken into account in order to be able to fully plan and support the educational use of instant online feedback. Compared to an oral, synchronous face-to-face feedback, the communication flow in a feedback setting using online forms on a learning platform is one-way instead of two-way, and communication takes places in written, permanent form. Additionally, the two settings differ in an important characteristic: online/written feedback can be implemented in a way to provide anonymity. According to a scale of studies (Kiesler and Sproul, 1992; Potter and Balthazard, 2002), computer-mediated communication may lead to increased voicing of radical opinions, reduced social inhibition (e.g. "flaming"), but may also increase the feeling of equality between communicators in comparison to face-to-face settings.

EMPIRICAL STUDY

Research Questions

This study's main underlying research question is whether it giving feedback face-to-face or online makes a difference when intended to support students in improving their oral presentations (RQ3, see Table 1).

Additionally we aimed at investigating how online feedback can be appropriately implemented in an educational context, trying to characterize appropriate settings for online feedback in presence courses. Although using online feedback in a face-to-face setting implies a discontinuity of media, we are convinced that the benefits of instant feedback outreach the possibly negatively perceived media disruption. Concerning the media characteristics of online feedback as discussed above, especially the reduction of social inhibition could lead to negative effects, like rude or demotivating feedback from colleagues. RQ2 therefore points to possible negative and positive effects of online feedback. As students are the main users in peer feedback, their preference is particularly important, leading to the RQ1.

The literature review on the educational use of feedback additionally identified characteristics of feedback that specifically promote learning. This is feedback immediacy (timing) on one hand, and the inclusion of students in the feedback process on the other hand. Therefore we were particularly interested how the implementation of the online feedback, which was designed accordingly, was accepted by students and whether and how it should be changed (RQ4).

Number	Research Questions
RQ1	What do students prefer: giving feedback online or face-to-face?
RQ2	Does the use of an online feedback tool (questionnaire) have more positive or negative effects on giving and receiving feedback on presentations compared to face-to-face feedback?
RQ3	Do students perceive the online feedback as helpful for improving their presentations?
RQ4	Was the implementation of the online feedback (point of time for feedback, feedback form) well accepted by students or should the implementation be modified?

Table 1. List of Research Questions

Study Context

Motivated to analyze the research questions, the study was conducted in the laboratory course "Human-Computer Interaction and Psychology" which was held at the University of Vienna in summer term 2008 as part of the computer science curriculum.

The accompanying e-learning platform included an upload area for the required documents and presentations and an area for online feedback. The laboratory course (five blocked units) was held in five parallel groups (15-20 students each) with a total of 80 students. The course's main aim was to demonstrate that a software's interface design plays an essential role for a product's success. Student teams (2-3 persons each) had to develop a design for an application. Student teams worked out project ideas, paper prototypes, detailed concepts and tasks for a usability test for its project, which they presented in the units.

Besides the team projects, students had to find and analyze good as well as bad examples of websites based on usability heuristics (Nielsen, 1993) and present improvement proposals for the chosen bad example in class (third unit) as an individual assignment.

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:

- Our experience from earlier courses demonstrates that students appreciate to receive feedback from peers (Bauer, Figl, Derntl, Beran and Kabicher, 2009; Figl et al., 2006). 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 (Bauer et al., 2009), 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.

- 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.

Interactive Online Feedback for Presentations

The online feedback scenario was implemented in the two course units:

- 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.

As depicted in Figure 1, main activities of online feedback were holding presentations as well as giving and reading online feedbacks. According to the UML notation for activity diagrams (Object Management Group, 2008), the three partitions (also called swimlanes) for "Presenters", "Instructor" and "Audience" indicate who is performing the activities, the arrows represent the temporal flow of activities. 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 on the 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.
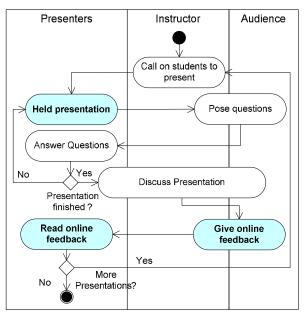

Figure 1. Activity Diagram of Online Feedback for Presentations

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, Data Collection and Analysis

For evaluating the implemented educational scenario of giving colleagues instant online feedback on their presentations, we used a one-group posthoc-design. Students of all five parallel groups experienced the same course and study design (i.e. experiencing online feedback once for individual, once for team presentations). Afterwards we collected students' reactions to the online feedback with an online evaluation questionnaire, which was filled out in the last course unit. The 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, we asked whether 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

67 students (84%) completely 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=4.09, SD=0.79) and most students wanted to continue with the online feedback activity in class (Mean=3.79, SD=0.99). Concerning RQ4, students' answers indicate that the implementation of online feedback was generally well accepted.
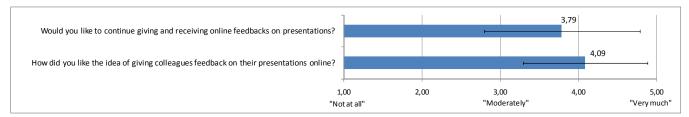

Figure 3. Students' Attitude to Online Feedback (n=67).

Figure 4 shows that students prefer giving feedback online in writing instead of orally (Mean=2.49, SD=1.21), addressing RQ1. Their preference for the optimal point of time for receiving feedback is, though, not clear (Mean=3.09, SD=1.41) relevant. While some students want to see their feedback results right after their presentation, others prefer to wait until everybody has presented. Thus, at the moment RQ4 cannot be clearly answered concerning the adequate point of time; however, qualitative results as described below provide some insights.
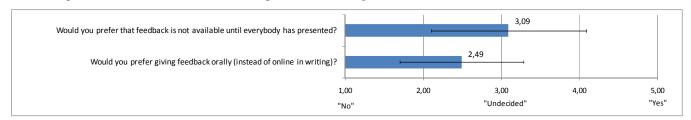

Figure 4. Students' Preferences for the Feedback Setting (n=67).

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 did you not like about the online feedback?" (Table 2). Most comments by students addressed 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). RQ3 can therefore be answered in the affirmative; according to students' perceptions the feedback was perceived as helpful for improving their presentations. 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."*

	Total number of nominations
Difference to face-to-face feedback	
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
Implementation issues of online feedback	
Feedback form	
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
Feedback on whole teams instead of individual feedback is problematic	4
Reference values for comparison with others/ other teams would be useful	4
Point of time for feedback	
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
Helpfulness of receiving feedback in general	9
The use of online feedback on presentations was an innovative and good idea	3

Table 2. Qualitative Analysis of the Evaluation Questionnaire about Online Feedback

Concerning differences between online and face-to-face feedback (RQ2), students indicated that anonymity was a great advantage of 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 :-)"* 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).

Regarding our specific implementation of the online feedback (RQ4) 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 appreciated 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 (RQ4), students generally appreciated 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."*).

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 Vienna 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.

Although students describe advantages and disadvantages of both online and face-to-face feedback, results demonstrate a clear tendency towards a preference for online feedback. Main reasons are the fast and uncomplicated handling, the perception that more feedback is provided from the participants, and anonymity.

The possibility for an anonymous implementation is thus a clear advantage of an online setting compared to oral face-to-face feedback. Students affirmed our assumption that more students will participate in anonymous settings and feedback will be more honest and constructive. 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.

Concerning the optimal point of time for receiving feedback, students' answers had been heterogeneous. Feedback right after the presentations has the advantage for reviewers to still remember details and for presenters to receive their feedback immediately; on the other hand, it is easier for reviewers to judge a presentation in relation to other presentations at the end of a unit.

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.

Concluding, successful implementations of online feedback in presence courses include following elements:

- The setting provides and ensures anonymity among peers.

- Feedback is given on individual rather than on team performance (even for peer presentations), however a reference value (mean judgment of other presentations) is provided to students to allow them to classify their own feedback.

- Feedback forms have to be short and easy to use. A combination of rating scales and open text format in the feedback form is particularly valuable.

- The implementation allows for instant feedback and prevents retarding the feedback process.

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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