

REPORT

SK-ITU Project:
Peer Review with Feedback Fruits

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1. Abstract

The pilot has yielded convincing results, receiving positive reviews from both teachers and students of the pilot courses. The system's functionality and the effective pedagogical application of peer review across various disciplines has been much welcomed. Furthermore, the Project Group has commended Feedback Fruits' responsiveness to inquiries and the productive weekly dialogue throughout the pilot period. Given the findings from teacher and student surveys and the Project Group's positive experiences, we strongly recommend that the University of Oslo (UiO) engage in strategic discussions with Feedback Fruits to explore licensing options and develop an implementation plan to make this system available to all teachers at UiO. We believe peer review can enhance the quality of education and foster a culture of collaborative learning among the students. This is an important asset for the students to learn in their studies and based on the comments from the pilot, Feedback Fruits facilitates this in a sufficient manner.

2. Introduction

In the spring of 2023, Omid Mirmotahari initiated a collaboration with the "IT i utdanning" group (ITU) at the Faculty of Mathematics and Natural Sciences' (MATNAT) to explore the potential of piloting an online peer review tool, Feedback Fruits. The proposal for funding was written by Andreas Tandberg, Helge E. Kleivane and Omid Mirmotahari – in the following they are referred to as Project Group (PG). The proposal was successfully granted funding from SK-ITU, and the first pilot launched in the autumn of 2023 with Mirmotahari's course IN1020 at the Dept. of Informatics and three seminar groups from Exphil at the Faculty of Humanities (HF). Building upon the initial success, the pilot expanded in the spring of 2024 to include four additional courses, three from HF and one from the MATNAT.

2.1. Motivation and SK-ITU-funding

In recent years, the ITU-group at the Faculty of Mathematics and Natural Sciences' has received numerous requests for a reliable peer review tool. Despite testing several IT systems for this purpose, none have proven to be satisfactory. UiO's Centre for Learning, Innovation and Academic Development (LINK) had previously expressed interest in testing Feedback Fruits but lacked the resources to pursue it at the time.

This proposal was a collaborative effort of the PG. Mirmotahari focused on describing the academic and technical aspects of the pilot, outlining the ideas to be explored using Feedback Fruits. Tandberg and Kleivane contributed by detailing the administrative and organizational framework, clarifying that the testing would be conducted through the Learning Management System (LMS) Canvas on behalf of the entire UiO, not just the Faculty of Mathematics and Natural Sciences. Furthermore,

they assisted in setting up the budget and conducting language editing. The ITU-group specializes in supporting course teachers in achieving their academic goals by handling administrative tasks and clarifying organizational frameworks, making this division of labour a natural approach to collaboration in such processes.

2.2. Why Peer Review

Peer review has become an increasingly popular pedagogical tool in higher education, offering numerous benefits for both students and educators. This section explores the rationale behind implementing peer review practices, the learning outcomes associated with it, potential challenges, and its broader implications for students' future professional lives.

2.2.1. Learning outcomes and benefits

Research has consistently demonstrated that peer review can enhance various aspects of student learning. Topping (1998) found that peer assessment can lead to improvements in students' writing skills, critical thinking, and metacognitive abilities. Moreover, Nicol et al. (2014) argue that peer review fosters the development of evaluative judgment, a crucial skill for lifelong learning.

Key learning outcomes identified in the literature include:

- Enhanced critical thinking and analytical skills (Liu & Carless, 2006)
- Improved self-reflection and self-assessment capabilities (Cho & MacArthur, 2011)
- Deeper understanding of assessment criteria and academic standards (Sadler, 2010)
- Development of communication and feedback skills (Nicol, 2010)

2.2.2. Collegial learning environments

Peer review can significantly contribute to creating a more collaborative and supportive learning environment. Boud et al. (1999) suggest that peer assessment practices can help build a sense of community among students, fostering a culture of shared learning and mutual support. This collaborative approach aligns with social constructivist theories of learning, emphasizing the importance of peer interaction in knowledge construction (Vygotsky, 1978).

2.2.3. Feedback literacy and professional competence

Developing students' feedback literacy is crucial for their academic success and future professional lives. Carless and Boud (2018) define feedback literacy as "the

understandings, capacities and dispositions needed to make sense of information and use it to enhance work or learning strategies" (p. 1315). By engaging in peer review, students not only learn how to provide constructive feedback, but also how to receive and act upon feedback effectively.

This skill is highly transferable to professional settings, where the ability to give and receive feedback is valued in collaborative work environments. As Boud and Molloy (2013) argue, developing feedback literacy prepares students for the realities of the workplace, where continuous improvement and peer evaluation are often integral to professional growth.

2.2.4. Challenges and considerations

While peer review offers numerous benefits, it is not without challenges:

Student resistance and scepticisms about peer competence (Kaufman & Schunn, 2011)

Variability in the quality of peer feedback (Gielen et al., 2010)

Time constraints and workload concerns for both students and instructors (Hanrahan & Isaacs, 2001)

To address these challenges, careful implementation and scaffolding are necessary. Providing clear guidelines, rubrics, and training for students can help improve the quality and consistency of peer feedback (Sluijsmans et al., 2002).

2.2.5. Economic and scalability considerations

For large courses, peer review can offer a practical solution to the challenges of assessment. While initial setup may require significant time investment, peer review can potentially reduce the overall grading workload for instructors in the long run (Topping, 1998). However, it's crucial to balance the benefits with the time required for training students and managing the peer review process.

Technology-enhanced peer review systems can facilitate the process in large classes, making it more manageable and efficient (Luxton-Reilly, 2009). These systems can automate the distribution of work, collection of feedback, and even provide initial quality checks on peer reviews.

2.2.6. Conclusion

Peer review in higher education offers a multifaceted approach to enhancing student learning, developing crucial skills, and creating a collaborative learning environment. While challenges exist, careful implementation and consideration of best practices can

lead to significant benefits for students, educators, and institutions alike. As we prepare students for their future professional lives, the skills developed through peer review – critical thinking, feedback literacy, and collaborative learning – remain invaluable.

2.3. Why Feedback Fruits

Several academic environments at the Faculty of Mathematics and Natural Sciences (MN) have previously tested peer assessment in both Peer Grade and Canvas. Peer Grade can no longer be used due to challenges with GDPR compliance. Canvas' tool for peer assessment ("Peer Reviews") was thoroughly tested by MN in the fall of 2022. It was found that Canvas does not have the functionality MN needs, largely due to two factors:

1. A need for a student list with enrolled students (plus submitted file) where the peer reviews from fellow students are attached/linked to each of the enrolled students.
2. The possibilities for extracting (quantified) data for use in learning analytics are very limited in Peer Reviews / SpeedGrader in Canvas.

Due to these factors, the project group decided to apply for funding as described in the introduction. Feedback Fruits was chosen as the preferred system for testing due to the limited peer review systems available on the market and the fact that LINK had already established contact with and shown an interest in testing it on behalf of UiO.

2.3.1. Key features Feedback Fruits

Automatic distribution of reviewers

FF automatically assigns reviewing tasks to each student within one or more student groups. The system makes sure that the assignments are evenly distributed among the students, that every student receives one or more reviewer(s), and that no two students are given the same task/the same student to review. Done manually, this could be a complex operation that would take some time to set up in, say, an Excel.

The user interface/workflow for students

As a student reviewing your fellow student's text in FF, you group your comments in different "criterias" set up by the teacher in advance (typically "language", "understanding", "originality" etc.) This allows the students to be easily guided by the teachers both in terms of how and what they give feedback on.

If you want to highlight a specific passage in the text that you want to comment on, you can easily mark the passage, write your comment and "assign" the comment to the right criteria. In addition to this, you will be notified by the system when your

assignment is done. It is also easy for the student to scroll down and find the reviews you have given and received if you want to reread them after the assignment is done.

Teacher's overview of the students and their reviews

As earlier stated, one of the features we were looking for in a peer reviewing tool was “a student list with enrolled students (plus submitted file) where the peer reviews from fellow students are attached/linked to each of the enrolled students”. Through the “View reviews” function in FF, the teacher can access such an overview of the enrolled students where the submitted file plus the received/given reviews for the student in question is included.

Extend deadlines

By hitting the “Grant extension” button you can easily extend the deadline for a peer review for one or more of the students. The overview is easy to understand, and it is easy to manage multiple extensions for one or more students.

Using rubrics to create clear marking criteria for the students

Customisable rubric templates ensure that all students are sufficiently informed about the course requirements, and have all they need to assess themselves, peers or understand feedback they receive from their instructors. Since the rubrics are reusable, teachers save time and can standardise their assessment activities with relative ease.

3. Technical installation / integration

The University of Oslo uses FS (Felles Studentsystem) as our main database for most data related to students, employees and courses. UiOs learning management system (LMS) is Canvas. Canvas has an integration with FS allowing the synchronization of different user roles and course data.

Feedback Fruits operates both as an integrated tool in Canvas and as a standalone platform. The user interface of FF is the same regardless of which solution is chosen, however there are some vital differences with regards to the synchronization of users. With the integrated Canvas-solution FF inherits all the data related to teachers and students in the course. This means that FF will be updated if a student withdraws or is added to the course. The standalone solution does not have any integration with UiO's course data or user data. In short, this means that the data has to be added manually, a process which will be much more time consuming than with the integrated Canvas-solution. As Canvas is used for most of UiO's courses this is not necessarily problematic, however for courses or departments where Canvas is not used the lack of a sufficient standalone solution could pose a problem. Although the PG has not tested the standalone solution extensively, we believe that it is strongly advisable to use FF with an LMS (Canvas at the present time for UiO).

4. Pilots

The courses chosen for the fall of 2023 were based on the case presented in the application sent to SK-ITU. This included Omid Mirmotahari course IN1020 at the Department of Informatics and a few of the seminar groups from Exphil. The inclusion of Exphil sprung from a profound interest in using peer review. For the spring of 2024 Stig Mikalsen at the Faculty of Humanities aided the PG by sending out a request for courses interested in testing peer review. Based on this, three courses from the Faculty of Humanities were included in the pilot. Additionally, one biology course from the MATNAT was included.

For the spring of 2024, the PG decided on a model of testing where each course staff was given a 1-1 introduction to Feedback Fruits and a standing invitation to contact PG if needed. During the introduction, the “skeleton” of the first assignment was created to get the teacher started. In addition, the PG contacted the pilot courses through the semester to check in and make sure that everything was going according to plan. The reasoning behind this was both a matter of resources available and a belief that the slight autonomy in use of FF would be a stress test on the teachers’ ability to use the system without the constant intervention of the project group.

4.1. Courses and use cases

Course code	Number of students	Peer review method	Number of peer review sessions
IN1020	700	Compulsory delivery using both Self-assessment and Peer-assessment	1 (total of 350 students)
Exphil	90	Live in classroom	1 per group (3 in total)
BIOS1130	125	Lab reports	2
HIS3090	90	Bachelor's thesis	2
KONS3061	25	Critical review of text on the curriculum and a term paper	2
SPA4504	6	Term paper	3

Fig. 1 Table of use cases

In the case descriptions, you will find the Exphil-pilot more detailed than the descriptions from the other use cases. We have chosen to emphasize this due to the objectiveness of the PG and as a guide through the whole process of implementing

and deploying FF for an “external” party. The other courses are given a brief description in 4.1.2 - 4.1.6 and then supplemented with the students’ notes and teachers’ notes in 5.1 and 5.2. Note that the appendix at the end of this report holds all of the summaries written by the teachers/administrative personnel from the different pilot courses.

4.1.1. Exphil

How we grouped the students and planned the peer review pilot

The seminar groups consisted of 107 students split into 3 groups. These 3 groups were again each divided into 8 subgroups. Each of the subgroups contained 3 - 6 students. It was between these 3 - 6 students within the subgroups that the peer reviewing took place. The system was set up so that each of the students received 2 reviews from the other students in the subgroup. We executed the peer reviewing “live” in a classroom with the students present on 3 different occasions (one session for each of the 3 groups). Each session lasted for 2 hours. The “live” peer reviewing was supervised by the course teacher and two people from the PG. Prior to the live sessions, we had 2 meetings with the course teacher and the IFIKK-administration to plan the pilot and the technical setup of FF.

Technical setup

The faculty administration set up the peer review assignment in Canvas together with a representative of the department administration at IFIKK. We set up 3 assignments in Canvas all together, one for each of the main groups. Prior to the pilot, each student had signed up for one of the subgroups within one of the main groups.

These Canvas subgroups (including students) were exported into FF when we set up the assignment. After this was done, all students including the course teacher were able to access the assessment in FF through their Canvas room.

To make sure that the students would know what to do right away, we included instructions in the first window in FF:

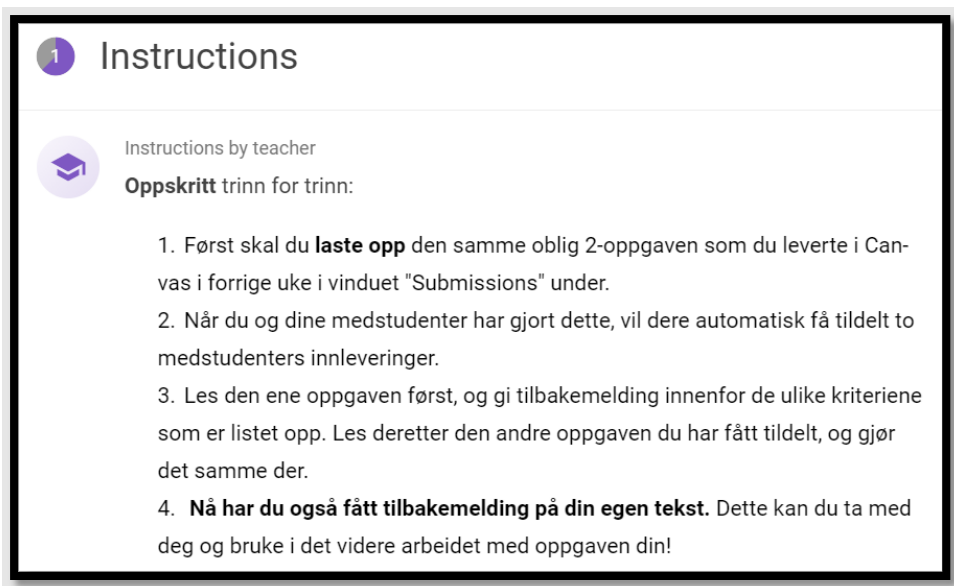


Fig. 2 Student instructions

Executing the live peer reviewing sessions

We were able to execute the 3 live sessions without technical problems that affected the pilot in any noticeable degree. Some of the students that had signed up for the subgroups did not show up for the sessions, and other students who had not signed up for the subgroups at all, showed up unannounced. As a result of this, we had to add students and rearrange the Canvas groups on the fly, minutes before the live sessions were about to start. FF responded well to these last minutes changes, and the groups in FF were instantly updated as a result of the changes made in Canvas. The course teacher monitored the process through the “teacher workflow” window in FF. The PG assisted the course teacher in manoeuvring through the teacher workflow window.

Conclusion

It is our opinion that FF is a responsive, intuitive system that is integrated well with Canvas through the LTI standard. A survey done at the end of the pilot sessions showed that 95 % of the students that participated reported FF as “completely intuitive”, “very intuitive” or “intuitive” in use (see 5.1). The course teacher needed some assistance with the workflow, but this isn’t necessarily due to flaws in Feedback Fruit’s user interface. This could just as much stem from the fact that peer reviewing, and especially done “live”, is a complex assessment form.

Furthermore, the pilot teacher of Exphil, Kari Sletnes has expressed interest in the continued use of peer review through FF. She emphasises that there should be a sufficient digital peer review system at UiO. See the appendix for the complete e-mail correspondence.

4.1.2. IN1020

Omid Mirmotahari, the course leader of IN1020 in Autumn 2023, led the application for piloting Feedback Fruits. Omid has prior experience with peer review tools such as Peer Grade and Canvas Speedgrader. IN1020, a first-semester introductory course at the Department of Informatics, has 500+ students. To investigate the learning outcomes and practical aspects of FF, the course leader utilized one of the mandatory assignments for this intervention. The student cohort was divided into three distinct groups: Group 1 employed the self-assessment tool (SA) in Feedback Fruits, Group 2 received feedback from teaching assistants (TA), and Group 3 participated in peer review (PA) through Feedback Fruits.

Currently, Omid is in the process of finalizing a scientific paper (see attachments) that explores the comparative impact of the three different feedback methods on each student group's performance from the initial draft to the final submission. The following graph (under publication) illustrates these findings:

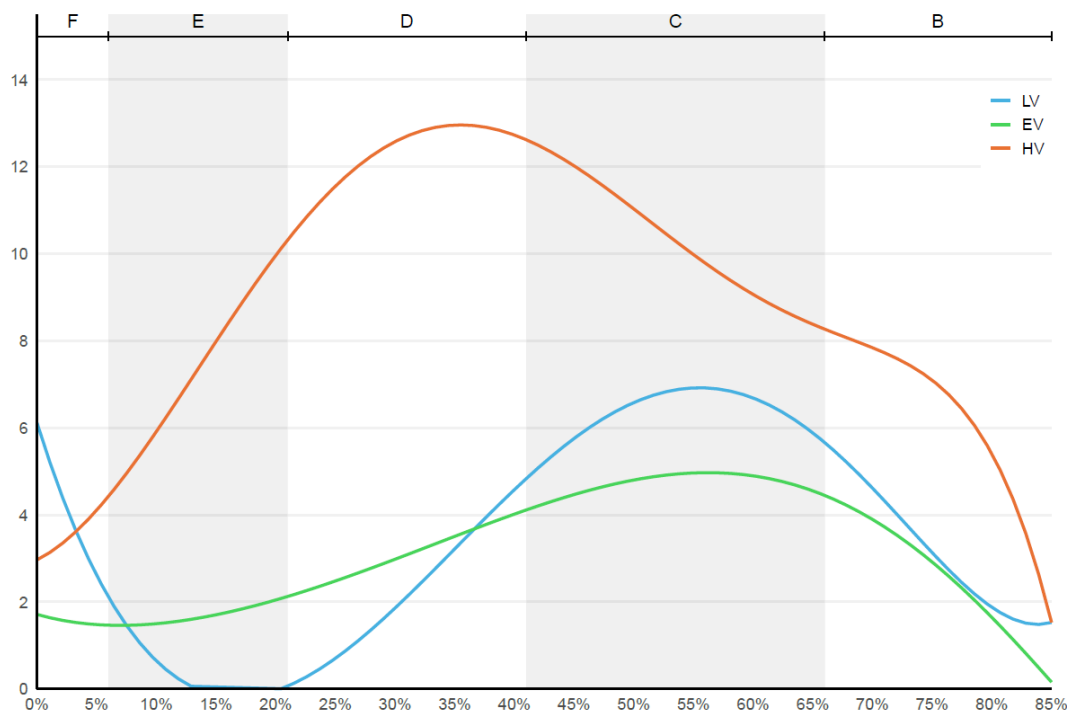


Fig. 3 Illustration of the effect of the different feedback forms on the students. Blue is for the teaching assistants (LV), green is for the self-assessment (EV), while the red is for the peer-review (HV).

The X-axis is the amount of points the students increased from first to last hand-in, while the Y-axis show the effect or impact on the students based on how well they scored initially. Firstly, the graph shows that all feedback forms helped the students significantly, secondly it shows that TA (blue line) feedback helps weak students surprisingly little and thirdly it shows that peer (red line) outperforms the two other means of feedback by a significant margin.

Further data collected includes students' reflections on their learning process (see attached report), in which students unanimously report positive personal experiences. These reflections encompass areas such as gratitude for the opportunity to participate in such a feedback process and the psycho-social impact of making new friends. The attached report provides a categorization of these reflections.

In the process of conducting this research, we have also considered the voluntary student-driven course evaluation for IN1020. To establish the statistics, there were 590 students qualified for the exam, with 528 students participating in this intervention (divided into 183 in the self-assessment group, 173 in the peer assessment group, and 172 in the TA feedback group). Despite significant marketing and emphasis from the teachers, only 187 students participated in the 2023 evaluation, a notable increase from the 64 participants in 2022. The negative responses concerning either the obligatory assignment (confusion or feeling of lack of information on how to proceed with the assignment), Canvas or Feedback Fruits (technical aspects) or the learning process (pedagogical aspects) are all well below the expected threshold, with the sum of negative comments (27)¹ being less than 5% of the total students qualified for the exam (see the appendix for details). Students critical of Canvas as a system (possibly confusing Canvas with Feedback Fruits) primarily attribute their criticism to its unfamiliarity and late introduction in the semester. It is important to note that Canvas is not typically used in IN1020 or at the Department of Informatics more generally.

As stated by Stephan Oepen, head of the department from 2020-2024, "The Department of Informatics has concluded that uniformity of the learning environment for beginner students is of such critical importance that Feedback Fruits through Canvas (ed.) is not applied in IN1020 or other first-semester courses in 2024 and in all likelihood for the foreseeable future."

A valuable insight for the PG and UiO is that courses not normally using Canvas face a higher threshold when implementing peer review through Canvas and/or Feedback Fruits. This issue needs to be addressed through rigorous information provided to the students. One option that has not been sufficiently tested is a stand-alone version of Feedback Fruits. The PG has, however, inquired through FF's technical support that this option is not feasible (see chapter 3, "Technical installation / Integration").

4.1.3. BIOS1130

Hans-Petter Hersleth has been using peer review in BIOS1130 for several years now. Previously he has tested both Peer Grade and peer review within Canvas. For the spring of 2024 he informed the PG that he would like to test FF. Peer review is used to allow the

¹ Out of the total of 187 who provided feedback on the course evaluation, 40 respectively gave feedback on the topic "formative assessment," and of these, 16 were critical of the specific mandatory exercise. Additionally, there were 58 responses the topic "digital platforms," of which 11 were critical of the use of Canvas / FF.

students to give feedback on two different lab reports that they are to hand in as obligatory assignments throughout the semester.

4.1.4. KONS3061

Douwtje Lieuwkje van der Meulen, the course teacher of KONS3061, has been interested in an adequate tool that would give her the possibility of doing peer review in a time effective manner. KONS3061 is a bachelor's course typically consisting of between 20 and 25 students. The students are given a grade based on a term paper. Feedback Fruits was used both for a draft of the term paper as well as an obligatory assignment where the students were supposed to give a summary and reflections on one of the articles in the courses' reading list.

4.1.5. HIS3090

HIS3090 is course designed around the process of, and actual writing of the bachelor's thesis. The topic of the thesis is chosen in cooperation with a tutor. The course has around 90 students. In addition to writing and working on their own thesis, there are two mandatory group sessions where students present their own papers and provide feedback on drafts of their fellow students. These group sessions are led by the department's learning assistants (master's students).

Typically, the learning assistants have been manually distributing the hand-ins to students manually in order for them to give feedback to their fellow students. There have been several difficulties with this solution, including a clear deadline for the different steps in the process, a fair system for extensions when needed, and clear information on what feedback should be given. Due to these experiences, it was natural to include HIS3090 as a part of the pilot.

4.1.6. SPA4504

SPA4504 is a small master's course typically consisting of 3-6 students with a final term paper to be handed in towards the end of the semester. Before this, the students first hand in a summary/outline of their research project and secondly, they hand in a draft of their term paper. The course teacher, Alvaro Llosa Sanz, used FF as a means of letting the students give each other feedback on the different steps in creating their term paper.

5. Results

Feedback Fruits provided the project group with an excel sheet summing up the activity within the system from UiO during the pilot period. As fig. 8 below illustrates well over 1000 students were enrolled in the pilot courses and of these ~850 were active users. The number of active teachers is relatively small. This is to be expected given that the pilot group gave specific training to one teacher per course.

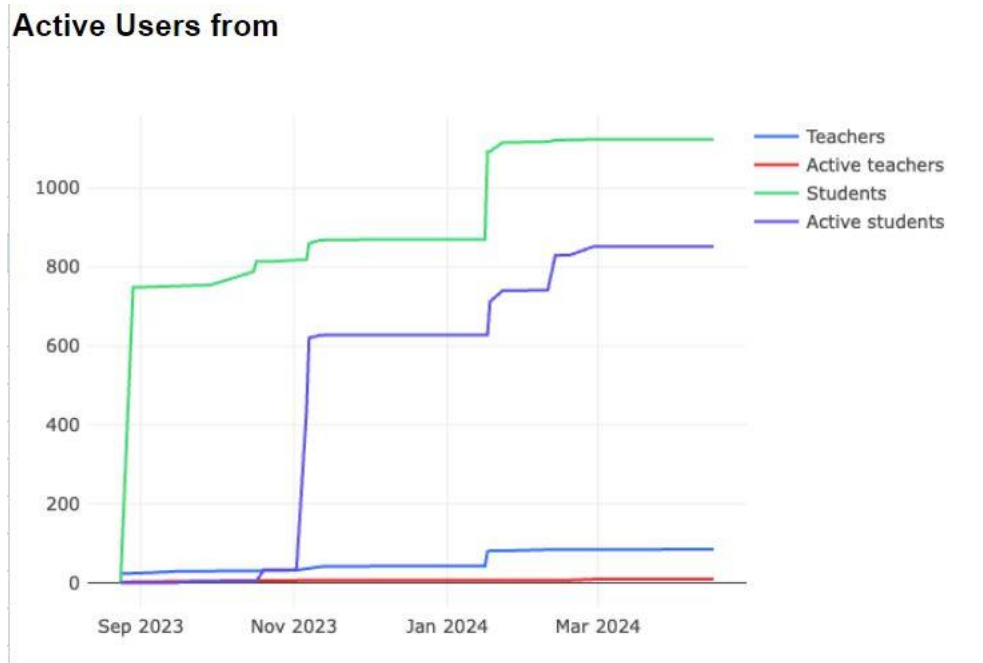


Fig. 4 Number of active students and teachers

5.1. Student feedback

As described in chapter 4.1.1 the peer review session in Exphil was conducted “live” in a 2-hour seminar session. The Project Group decided that it would be beneficial to create a short survey (“Nettskjema”) where the students could give a 1-6 evaluation on the following two questions:

1. To what extent is the peer review tool Feedback Fruits intuitive to use?
2. To what extent do you feel that participating in peer review is academically beneficial?

The students were asked to rate the two questions from 1 to 6, where 6 was “Completely intuitive/useful” and 1 was “Not intuitive/useful at all”. Additionally, the students were given the possibility of writing any comment (good or bad) that they might have. The PG decided that it would be most beneficial to ask the students to fill out the questionnaire at the end of each seminar session in order to get as many answers as possible. 54 out of 59 attending students replied to the questionnaire. The pie chart below presents the response to the first question and shows that FF was found to be very intuitive in use.

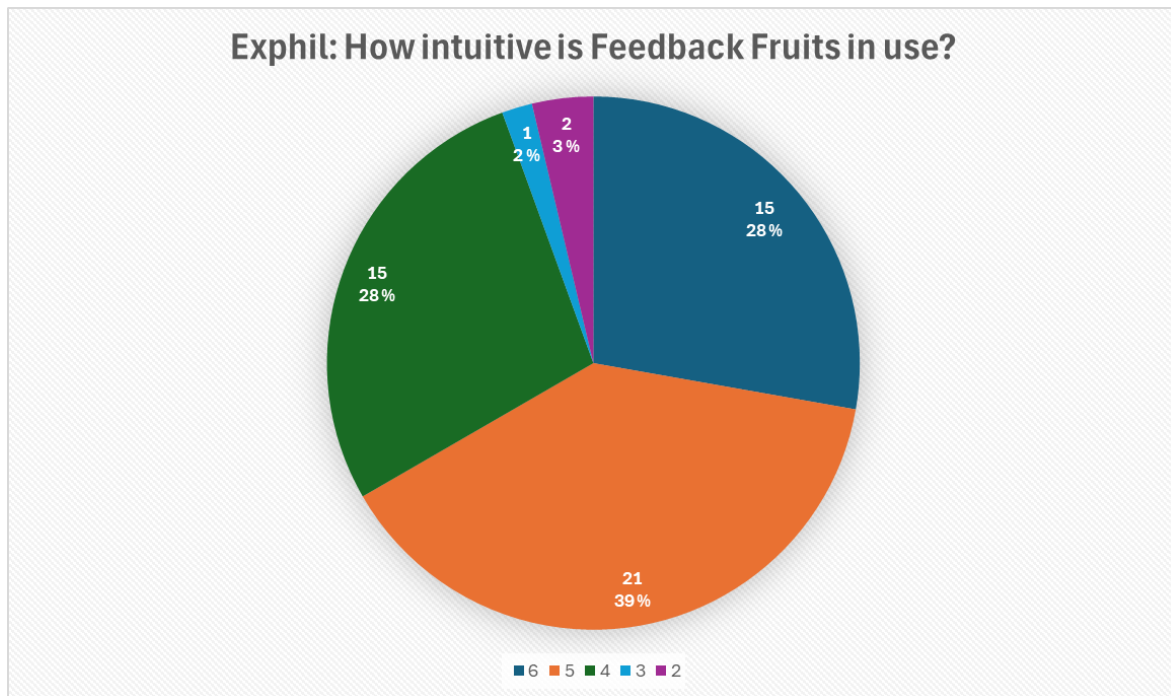


Fig. 5 How intuitive is Feedback Fruits in use?

Given that peer review was done “live”, and the students had no prior knowledge of FF this result is remarkably positive - 95% of the students gave a positive response.

The students also gave favourable feedback to the second question in the survey. A total of 83% of the Exphil-students gave the peer review sessions a 4, 5 or 6 indicating that a vast majority of the students felt that the peer review group session had given a positive learning outcome.

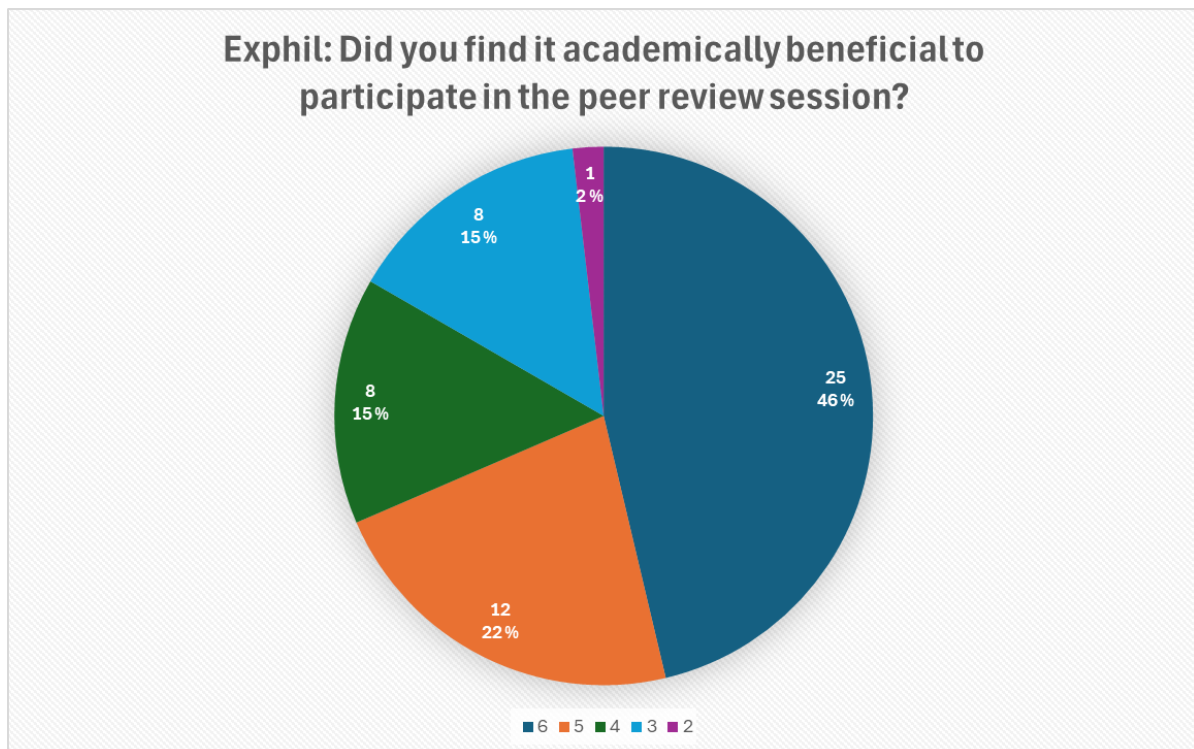


Fig. 6 Academically beneficial to participate in peer review

For the spring semester the PG decided to use the same question form that was used for Exphil. The head teacher/administrator was asked to distribute the question form. While this method for collecting response is not as effective as the one used in Exphil, around 27% (60 out of 222) of the students registered to take the final exam still responded to the questions.

67% of the students that answered the survey gave a “5” or “6” to the intuitiveness of the system. Interestingly, the students from the Exphil-pilot had the exact same percentage rating the system 5 or 6. This indicates that FF has a high user satisfaction score.

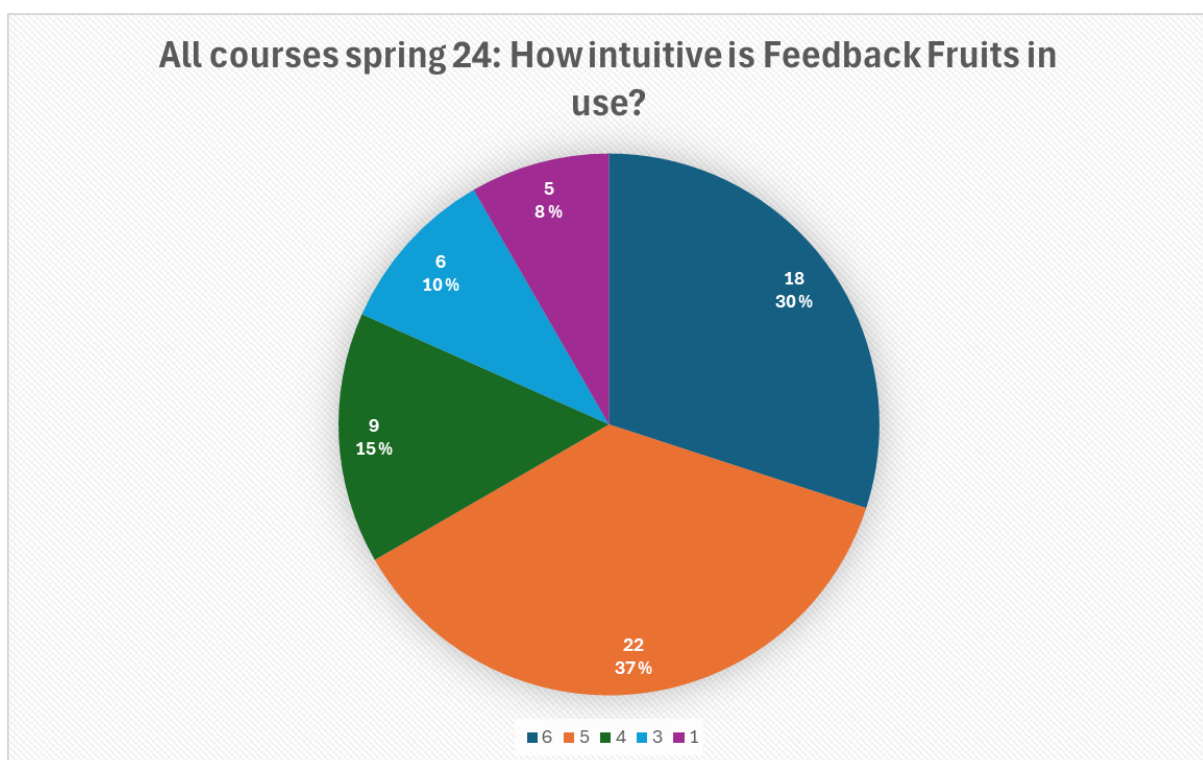


Fig. 7 How intuitive is Feedback Fruits in use?

Note that 8% gave the system a “1” and 10% gave the system a “3”. This combined percentage of 18 is significantly higher than in the Exphil-pilot where a combined 5% gave the system a “3” or a “2” on intuitiveness in use. While there may be several explanations for this difference it is obvious that when the users do not receive immediate help (as was the case with the Exphil-pilot) some people will be more frustrated leading to a negative response. A few students did point out that they experienced “bugs” in FF while giving peer review which would account for some of the negative response.

With regards to the second question of the survey, 76% of the respondents from the spring courses rated the system with a score of 4, 5 or 6. Although a majority answered

“4” (33%), this is still a relatively high evaluation of the peer review assignments created by the course teachers.

In the biology course BIOS1130 Hans-Petter Hersleth conducted a short survey as a part of the course evaluation. Hans-Petter has tested both Peer Grade and peer review in Canvas previously, and it is therefore especially interesting to see how he reflects on the feedback from the students both from the peer review in general and FF specifically:

The course itself gets an average score of 4.2 out of 5 points. the average score on peer review is 3.4 out of 5 points, and 15% give it 5 out of 5 points. The peer review gets a slightly lower score than the course in general. 46% say that they learned "a lot" from looking at the predefined questions they had to answer when giving feedback on the reports. As expected, students believe they learn more from GIVING feedback than receiving feedback. Students also believe that the peer review process helped improve their own report. 39% say somewhat, 31% say a lot, and 8% say a great deal.

46% answer that they think peer review should be used in more courses at the Department of Biosciences (IBV), and only 15% answer no. This is roughly the same response rate we had when we used PeerGrade, but when we had to use the simple variant in Canvas, very few thought that it should be used in other courses. This shows that for successful peer review, a dedicated program should be used for the evaluation. 85% of students give Feedback Fruits program a score of 4 or 5 out of 5 points.

The answers Hans-Petter has received from his students correspond well with the student response of the PGs' survey. The students are generally pleased with Feedback Fruits as a peer review tool and peer review as a pedagogical tool for increasing learning outcomes.

5.2. Teacher feedback

Each teacher/administrator from the pilot has written a brief report on their experiences using Feedback Fruits as a peer review tool. These reports are added in full length in the appendix. Below is a summary from the reports. Please note that a few of the reports are written in Norwegian, and GPT UiO has therefore been used to translate some of the quotations used in 5.2.1 - 5.2.3.

5.2.1. The use of Feedback Fruits to facilitate peer review

Several of the teachers have pointed out that FF has a slight threshold for beginners. This is explained by the fact that FF have a lot of different options when setting up an assignment and the ramifications of these choices are not always easy to foresee before the assignment has gone live. On the other hand, the teachers also made note that the “system is easy to user and has a clear structure. Once you’ve been through the process of setting up a peer-review assignment, it’s easy to create new tasks. Most of it is then self-explanatory.” (Douwte's report from KONS3061).

Several teachers also reported that it was easy to give individual deadlines or move students from one group to another. This has also been the PGs' experience. During the "live" peer review in the seminar groups of exphil, the project group had to both move people to different peer review groups and give individuals added time. Given that the FF is not really designed to perform these types of activities "live", the system exceeded our expectations.

The teacher of BIOS1130, Hans-Petter Hersleth, pointed out that the functionality of allowing predefined questions as queues for what the students should give feedback on worked well in FF. Alvaro Llosa Sanz, the teacher of SPA4504, concurs with Hans-Petter and adds: "One particularly useful feature is the ability to create feedback categories, which allows for the adaptation of the activity to various subjects and assessments, while also limiting the minimum amount of expected feedback in each category." All of the teachers noted the usefulness of the criteria-feature and would probably highlight this as one of the key features of FF. Marthe Bogen, the administrator of HIS3090, reported similarly: "The feature I was most satisfied with was the ability to enter our own criteria sections, where we could use a self-developed assessment guide that the students have become familiar with earlier in their studies. This also clarified the expectations for the students."

Feedback Fruits' streamlined feedback structure, whether it is criteria- or scale-based, makes it easier and faster for the teachers to read and get an overview of all the feedback given. Furthermore, as Douwtje points out, it makes it easier for the teacher to pick up on where common problems occur across different texts and therefore gives the teacher the possibility of addressing this in plenum.

Douwtje also points out that she had great success with using scale-based rating. Douwtje used the scale-based feedback as a quick and effective way for students to give feedback: It allowed the students to spend less time giving feedback on some parts of the text while focusing more intently (with criteria-based feedback) on other parts.

5.2.2. Overall experience

The teachers are unanimously positive to both the peer review sessions in their courses and the piloting of the peer review system. Alvaro concludes:

In conclusion, the use of Feedback Fruits in course SPA4504 has been satisfactory, providing an effective tool for the feedback process in research writing. Despite some initial complexity in the setup, the advantages and customization possibilities outweigh this difficulty significantly.

As previously discussed, Hans-Petter conducted his own evaluation of FF and the peer review done in his course, BIOS1130. In the final remarks from his report, he points out:

[...]I would say that Feedback Fruits is a good program for conducting peer review in larger courses (BIOS1130 about 120 students) and should be continued. [...]Most are positive about

peer review, and even if not everyone feels they learn so much from receiving feedback, they believe they learn most from giving feedback and that in the process, they improve their lab report, which we also notice from the teaching side.

Douwte, amongst other aspects, highlights the possibility for teachers to save time through the use of peer review.

Finally, I have the impression that the students do not expect the teacher to give comments by using this tool, as opposed to when I asked them to write a half-page text. There have been no comments about them not trusting the feedback from fellow students. This has saved me a good deal of time. [...] I really hope that the University will start using this tool. It would be exciting to test out different types of assignments.

Marthe has a fairly broad overview of the possibilities peer review and FF could give for several courses at the Department of Archaeology, Conservation and History. Furthermore, she points out something that must be addressed in the event of a licence purchase: How will UiO establish a support line, and who should be in charge of this?

I recommend using Feedback Fruits and see potential for using the tool in more courses. In the event of a potential purchase, I would recommend ensuring good channels for feedback and opportunities for development based on the feedback. Furthermore, I would recommend that there is a "Feedback Fruits" expert at the departments. If each course coordinator is individually responsible for this, with all the possible choices available, there is a risk that the tool will not function as desired or intended.

5.3. Common needs identified (what do UiO need from the system)

Based on the reports from the pilots, one of the key features of peer review in FF is the ability to reuse the settings from a previously created assignment. Building on this, it is clear that UiO should make use of both generic FF-peer review templates as well as more UiO specific templates. Ideally, UiO would develop some "key" templates for both newcomers of peer review and more use case specific templates.

Similarly to templates for assignments it would also be beneficial to create a pool of templates for criterion-based feedback. The use cases from the pilot illustrates that criterion-based feedback will most likely be the most used system for guiding the students in their feedback. Although the templates would probably not be used as is, they would certainly serve as inspiration and be time saving.

Several teachers from the pilot courses wanted groups created specifically for the peer review assignment. Feedback Fruits only uses groups created in Canvas. Consequently, it might be beneficial for UiO to create a guide that shows teachers how they can create groups in Canvas that can be used for Feedback Fruits activities.

Feedback Fruits is a complex tool with lots of different settings / option. In addition to good templates, UiO will need a webpage with information on the benefits (and challenges) of peer review as well as specific information on the use of Feedback Fruits that would help teachers and administrative personnel.

Finally, and worth noticing is the possibility of extracting data from the FF. This can be done in several ways and depending on what the course staff would be interested in detecting.

6. Other aspects

The Project Group asked FF to compile an overview of the different institutions in Norway currently piloting (or already signed an agreement) FF. Below is the overview of the Norwegian institutions as well as a similar list for Sweden and Denmark:

Norway: HVL Western Norway, Volda University College, University of Agder, NLA University College, NTNU, OsloMet, Kristiania, University of South-Eastern Norway, BI and NMBU

Sweden: MDU, University West and KTH

Denmark: University of Copenhagen (KU), Aarhus University (AU), Technical University of Denmark (DTU), University of Southern Denmark (SDU), Roskilde University (RUC), Copenhagen Business School (CBS), Copenhagen Business Academy (CPH), Professionshøjskolen Absalon

6.1. Feedback Fruits' plan for aligning Norway's educational institutions

FF has a plan for establishing a platform for the FF-users from the different educational institutions in Norway. With regards to how this is to be done little details are available, however, FF has given us the following information:

“We are planning to host a community of practice event in Copenhagen, like the one that was hosted in Iceland, where we invite all Danish partners and discuss topics like using rubrics, self-assessment, peer feedback as a form of active participation, etc. and are hoping to organise a similar community event online for Norway too.”

Furthermore, FF is currently a part of a SIKT tender. The PG has little information about this tender and its outcome, and it is likely that the central administration at UiO knows / will know more about this later in the Autumn / Winter.

7. Discussion and conclusion

Feedback Fruits has, as the evaluation from the teachers and students show, received favourable praise. The system is generally perceived as user friendly, although students and especially teachers have reported on a certain threshold to get started with peer

review in FF. The Project Group agrees with this observation; however, we believe that FF can be made available to a large group of teachers and students with the right use of templates and UiO-specific quick guides.

The PG has not performed a survey on the demand for peer review throughout UiO. It might be beneficial for UiO to do this in order to get a sense of the interest from the entire university. It is the PG's impression that many teachers would benefit from using peer review in their courses and that access to a good system that provides this would give an easier way to get started. The system has shown resilience both in large courses (where automatic distribution and automation is key) and in smaller courses where larger texts like term papers, bachelor's thesis and lab reports are often used.

If UiO decides to engage in conversations with Feedback Fruits, the PG recommends that one inquire into the way in which UiO as an institution can give feedback and even more so, request, changes or new functionality. Based on the experiences over years with Canvas and Inspira it is not secret that there is a long way from a functionality request to an actual adaptation of said need. How do FF differentiate between functionality request and bug fixes and how fast are bugs followed up on and fixed?

Furthermore, UiO needs to decide on who should be in charge of the implementation of Feedback Fruits. How should a UiO-peer review web page look like? How should the template databank be created? Who should be in charge of the choosing the UiO-wide templates? Is there a need for a local "Feedback Fruits expert" at each faculty? The project group does not have a clear answer to this, but with regards to the pedagogical use of peer review it is natural to look to LINK.

Lastly, there is the question of cost. While this has not been a part of the PG's evaluation it is clear that UiO needs to see the cost in relation to the potential use at the different faculties. Just before summer, Feedback Fruits' representative Ian Haugh, presented a preliminary price offer to UiO's central administration. The idea of this meeting was simply to give key figures outside of the PG an idea on different pricing possibilities moving forward. If it is decided that the central administration should look closer into a possible contract some information is already available.

7.1. Recommendation

Feedback Fruits has received positive evaluation from both teachers and students in the pilot courses - both in terms of technical stability and functionality as well as pedagogical outcome and learning. The Project Group has experienced fast response time as well as a constructive and helpful dialog with Feedback Fruits throughout the pilot period. Given the findings from teacher and student surveys and the PG's positive experiences, we strongly recommend that the UiO engage in strategic discussions with Feedback Fruits to explore licensing options and develop an implementation plan to

make this system available to all teachers at UiO. We believe peer review can enhance the quality of education and foster a culture of collaborative learning among the students. This is an important asset for the students to learn in their studies and based on the comments from the pilot Feedback Fruits facilities this in a sufficient manner.

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