



# Technology Evaluation Report: peerScholar

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**Note:** This report summarizes outcomes of a specific UBC pilot. Findings do not reflect broader or official UBC opinions about the learning technology evaluated.

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## Executive Summary

This evaluation sought feedback from UBC instructors and students piloting peerScholar, a peer review and self-assessment tool with three distinct steps for students:

1. Submit an assignment
2. Review peer work based on instructor-set rubrics
3. Receive peer feedback and (depending on instructor preferences):
  - a. Rate/give feedback on the feedback and/or
  - b. Revise and resubmit the assignment and/or
  - c. Submit a self-reflection

Four instructors and 216 students provided feedback during the consultation period that ran between September 2017 and April 2018. The six courses in the official pilot were from Applied Science, Arts, Land and Food Systems, and Medicine. Half of these were first-year courses, with one each from third year, fourth year, and the graduate level.

Most instructors thought peerScholar worked quite well as a platform for peer review assignments. They particularly appreciated its anonymity and highly customizable peer review options. Many saw additional value in the feedback-on-feedback feature, which seemed to help scale peer review activities with minimal overhead (since attaching ratings to feedback appeared to encourage quality and easily flag low-performing reviewers). Asking students to review feedback also felt like a positive and important extra learning opportunity, prompting students to critically consider the effectiveness of their own feedback writing.

The biggest downside of using peerScholar for instructors was the numerous technical glitches that popped up, likely the result of the application still being in active, earlier-stage development. While all instructors were quick to downplay these glitches in light of the perceived benefits of the tool (and the quick resolution of most issues), the problems did significantly affect the workflow for some students (e.g., submission formatting was changed, submissions reportedly lost at the reflect phase, feedback ratings not seen). Some instructors also struggled with assigning marks due to peerScholar's poorly labelled data

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extract and the fact that not all students would always complete all stages of the assignments (though this latter issue is likely to occur with any peer review application).

Student response to peerScholar overall was also largely favourable, with two-thirds reporting a positive experience. Open-ended comments reflected that more students found peer review helpful than unhelpful, and peerScholar supported the process by enabling quick feedback from multiple peers, guiding the feedback writing through the specific instructor-set prompts, and providing students an easy way to see (and informally compare their work to) their peers' work. In the three courses that asked, the feedback-on-feedback feature reportedly increased motivation to write more detailed feedback for a third to a half of the students in each course. Students also rated usability high, with numerous respondents describing the application as easy to use, and several noting the helpfulness of the contextual commenting feature specifically (allowing highlighting of peer work directly to leave inline comments).

On the other hand, the open-ended comments also showed that some students found peerScholar assignments sometimes resulted in poor peer feedback (whether due to lack of understanding or caring on the part of the peer), despite its feedback-on-feedback feature (though this could have still improved the average quality). Additionally, similar to the instructors, students reported numerous technical glitches encountered during the term, most frustratingly ones that significantly altered the formatting of text-based submissions and others related to saving and submitting that resulted in lost work. But it is noteworthy that students remained positive overall about the application, in spite of these setbacks, and a few explicitly hoped the bugs could be resolved, so they could use peerScholar again in future courses.

Based on this pilot's outcomes, the recommendations for how peerScholar could best be implemented at UBC include:

1. Limit initial use to teams comfortable with evolving technology
2. Understand the current limitations with using groups
3. Run test assignments before going live
4. Plan how to deal with marking variations
5. Enable (with commenting) and incentivize the feedback-on-feedback

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6. Clearly articulate peerScholar's phases and process to students
  7. Train students specifically in contextual commenting

Implementing peerScholar with these recommendations may help resolve some of the concerns brought forward by instructors and students and improve future users' perceptions of the tool's pedagogical value.

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## Goal

This evaluation sought feedback from UBC instructors and students piloting peerScholar, a peer review and self-assessment tool. The tool's review process has three main phases:

1. **Create:** Students submit an online response to an assignment.
2. **Assess:** Students see an instructor-set number of their peers' submissions, one after another. In this context, students review their peers' work (and their own, if enabled) based on one or multiple instructor-provided rubric(s).
3. **Reflect:** Students receive peer feedback for their own submission, and may (depending on instructor preferences) rate this feedback, then revise and resubmit their submission and/or submit a self-reflection. Students may also have access to the feedback they received on their feedback.

Three features set peerScholar apart from other peer review tools currently in use at UBC:

1. peerScholar offers substantial **flexibility of format** in how the peer reviews can be set up, with virtually no restrictions on the number of fields, type of fields, or scales used. Canvas and edX peer review allow for minor customization but with certain fixed and unchangeable elements (e.g., a required text box)<sup>1</sup>.
2. peerScholar allows for equally customizable **feedback-on-feedback** (sometimes referred to as backwards feedback), meaning students can be asked to rate and/or comment on specific aspects of the peer feedback they receive.
3. As noted earlier, peerScholar's **reflect phase** gives the option for students to revise and resubmit an assignment and/or submit a self-reflection, after they have received and considered their peer feedback. While other UBC peer review tools may offer a form of self-assessment, treating this as a separate third phase—and with the ability to resubmit—is unique to peerScholar.

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<sup>1</sup> As peerScholar is designed exclusively for peer review, it can more easily provide additional options than built-in tools for general learning management systems.

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This report will detail the methodology used in evaluating peerScholar, why instructors chose to use it, the potential pedagogical value identified by people in the pilot, and how the tool could best be implemented at UBC.

## Methodology

The peerScholar official pilot ran during the 2017/18 W1 and W2 terms in six courses (with each course using it for one term), although some instructors had also used prior versions of peerScholar in previous terms. Four instructors were interviewed at or after the end of the relevant term. Each interview consisted of 15 questions (see [Appendix A.1](#)), directly or indirectly addressed during in-person meetings.

Students in five of the six courses were asked to respond to online or paper-based surveys near the end of the relevant term; 216 in total responded prior to May 2018. At the time of the survey, all students had used peerScholar at least once to complete multiple peer reviews and receive peer feedback. The suggested student survey included 9 questions (see [Appendix A.2](#)), although not all these questions were used in each course. Five students from one of the surveyed courses also participated in an optional focus group session in November 2017. While this session sought to explore peer review more broadly, many student comments related to peerScholar itself and that feedback is included here as well.

The types of courses in the official pilot came from Applied Science (Mechanical Engineering), Arts (Psychology), Land and Food Systems, and Medicine (Pathology & Laboratory Medicine). Half of these were first-year courses, with one each from third year, fourth year, and the graduate level. Summarized use cases for each course are provided below.

The primary difference in tool application was the substantiveness of the initial submission, which impacted how many peer review assignments instructors ran during the term as well as how many peer submissions each student was asked to review and the marks assigned.

Course	Students	Assignments
<b>Course 1</b> Applied Science First Year	840 students <b>15%</b> responded	2 assignments: a) 1-page personal letter b) 5-10 page technical memorandum 3 peer submissions reviewed/first assignment 2 peer submissions reviewed/second assignment Feedback-on-feedback, no revision/formal reflection 10-15% of course mark from peer review assignments Marked based on completion, peer reviews
<b>Course 2</b> Land and Food Systems Graduate Level	14 students (not surveyed)	1 assignment (in peerScholar): a) 1-page sketch of a problem tree (completed in teams) 2 peer submissions/assignment Feedback-on-feedback, revision but no formal reflection 15% of course mark from peer review assignments Marked based on initial submission, revision
<b>Course 3</b> Applied Science Third Year	113 students <b>7%</b> responded	3 assignments: a) all 10-15 page technical design reports (completed in teams) 2 peer submissions reviewed/assignment Feedback-on-feedback, no revision/formal reflection 10-15% of course mark from peer review assignments Marked based on completion, peer reviews, TA mark
<b>Course 4</b> Medicine Fourth Year	14 students <b>100%</b> responded	2 assignments: a) 4-5 page report b) 3500-character limit abstract 3 peer submissions reviewed/assignment Feedback-on-feedback, revision and formal reflection for second assignment 50% of course mark from peer review assignments Mark based on completion, peer reviews, feedback ratings

<b>Course 5</b> Arts First Year	332 students <b>10%</b> responded	5 assignments: a) all 300-500 words on relating topic to real world 6 peer submissions reviewed/assignment Feedback-on-feedback, no revision/formal reflection ~10% of course mark Mark based on completion, peer reviews, feedback ratings
<b>Course 6</b> Arts First Year	308 students <b>11%</b> responded	4 assignments: a) all 300-500 words relating concept to real world 4-6 peer submissions reviewed/assignment Feedback-on-feedback, no revision/formal reflection ~10% of course mark Mark based on completion, peer reviews, feedback ratings

## Findings

### Instructor motivations

#### Implement effective peer review

Instructor learning objectives varied based on the specific assignments they gave in peerScholar. But, as might be expected, instructors broadly wanted to use a peer review tool to: 1) enable student learning through critical evaluation of similar work (*"the act of assessing others' work can be a rich learning experience in and of itself"*) and 2) provide more and more *"regular, timely"* feedback to students on their work.

While some instructors liked that peerScholar offered the unique benefits noted earlier, only one instructor was influenced to choose peerScholar specifically because of them (i.e., the ability to revise and resubmit the assignment). All other instructors acknowledged that another peer review tool could probably have initially taken the place of peerScholar to accomplish what they wanted—in fact, one instructor ended up having to use Canvas's peer

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review tool due to lack of group functionality in peerScholar—though this attitude shifted for some after using the application.

## **Instructor response to using peerScholar**

Since instructor primary goals were basic requirements of any peer review tool, peerScholar had no trouble meeting these.

### **Application enabled anonymous and flexible peer review**

In terms of enabling critical evaluation of similar work, instructors liked two particular aspects in how peerScholar handled this. One, peerScholar could present the peer work anonymously, which for some instructors *“addresses our concerns of students favouring friends or penalizing adversaries”* as well as enabling students to safely share personal details in their writings. Two, all instructors came to appreciate the extensive customization peerScholar allowed in how students could be asked to review. For each assignment, instructors set the number of submissions students would see, added one or multiple rubrics, and could require both closed and open-ended responses, with no response considered mandatory by the application. *“With the options, you can set it so the peer feedback is formative or is for grades”* (qualitative or quantitative) or a combination, and add weights for each. *“I’ve yet to find a restriction in setting up assignments”*, making it easy to *“set up the assignment so it really matches [intended outcomes]”* and ensure *“the emphasis is really about helping students improve”*.

### **Feedback-on-feedback feature promoted quality feedback**

As for generating feedback, most instructors came to see value specifically in peerScholar’s feedback-on-feedback feature. This seemed to allow scaling peer review without sacrificing the quality of feedback received from peers. Some instructors thought this was because *“it changes the feedback the students give knowing that they’re evaluated”* (and, importantly, in some courses, marked in part on that peer evaluation), *“while providing a mechanism for students to identify unfair grading”*. That is, if one student did receive consistently low ratings, the instructor (or their teaching assistants) could investigate further, rather than trying to scan large classes as a whole to identify low-performing students (or in lieu of that, having

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poor feedback go unflagged entirely). As one instructor put it, *"it's allowed me to do something that I would not be able to do at all with the [small] person power"* of a relatively lean instructional team overseeing a large course.

### **Feedback-on-feedback feature enriched student learning**

While potentially improving the initial feedback, some instructors also noted this multi-tiered peer review meant students were *"taking on tasks they wouldn't otherwise"*, *"enriching the student experience in multiple ways"* that wouldn't necessarily be possible with other peer review tools. *"It allows the whole process loop to come all the way around"* in that students practice writing, receiving, rating, and receiving ratings<sup>2</sup> for peer feedback—so *"theoretically, it helps them improve all of those skills in the future"*. For a couple of instructors, *"that's been one of the favourite things about the system"*, this additional ability to *"close the loop"* and create more of a two-way conversation around peer feedback, rather than the typical approach of giving feedback with no sense of its reception.

### **Technical issues throughout pilot**

On the flipside, technical glitches were by far the biggest issue instructors reported—basically *"hiccups throughout the whole process"*—perhaps a byproduct of the tool being in active, earlier-stage development<sup>3</sup>. These included problems on the instructor side (e.g., the inability to check completed status of each step for each student, a mismatch between instructor preview and student view, wrong records of date/time) and problems reported by students to instructors (e.g., assignments showing incomplete when complete or vice versa, formatting issues, browser difficulties). Most frustratingly, multiple students reported self-reflection work being lost: *"they all<sup>4</sup> said they hit submit and it disappeared"*, which was difficult for instructors to prove or disprove and then assign appropriate marks.

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<sup>2</sup> It should be noted, due to a technical glitch, this function was not available for all W1 courses.

<sup>3</sup> The first official "live" version launched in September 2017.

<sup>4</sup> All students in the course who reported this issue, not all students in the course.

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However, all instructors were quick to downplay the glitches, describing these as “*very minor growing pains*” of an evolving system, and those with prior experience with the application seemed to agree “*every iteration of it gets better*”. Instructors also largely praised the response time of peerScholar and UBC support staff in addressing issues, noting “*almost all of them were resolved*” during the course of the term. But a few outstanding bugs remained, most notably a problem with students not seeing the feedback ratings they received, at the time of the W1 interviews<sup>5</sup>. And one instructor in particular needed better group functionality in order to use peerScholar for future courses. (This was not technically a glitch, but from the instructor perspective caused similar disruption, due to a lack of testing the assignment ahead of time.)

### **Limitations in using application’s data downloads for marking**

Another challenge of peerScholar for some instructors was the process of assigning marks<sup>6</sup>. The biggest pain point here related to how difficult the data downloads from peerScholar were to interpret. The extracted reports “*they’re just really hard to use*”, in large part because the labels for the columns “*mean something to the developers*” but weren’t in the language instructors expected. “*Orienting yourself to the reports takes a bit of thought*” and “*it would be nice if that report had helpful titles*” instead, so instructors didn’t have to struggle so hard to figure out “*how am I supposed to calculate from this?*” Further complicating the issue was that instructors could not always accurately set the student’s mark in the tool (when manual manipulation was needed), and yet peerScholar required marks be released to students in conjunction with seeing their peer feedback. So students would get feedback, but then “*they see the [system-]calculated grade and freak out*”, requiring instructional team reassurance that the mark in peerScholar was actually meaningless.

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<sup>5</sup> As of this writing, no outstanding issues from the pilot remain. From the LT Hub perspective, this pilot did not accrue more bugs than other pilots, though it may be that issues were more disruptive to instructor and student workflows, bringing them more to the forefront of feedback conversations.

<sup>6</sup> In terms of what was available in the user interface, the marking options in peerScholar are fairly robust compared to other tools (e.g., allowing weights for each phase, completion marks for each phase, options to incorporate peer judgement of initial submission and feedback); these were simply not enough for those instructors who preferred to extract outcomes and customize outside the tool.

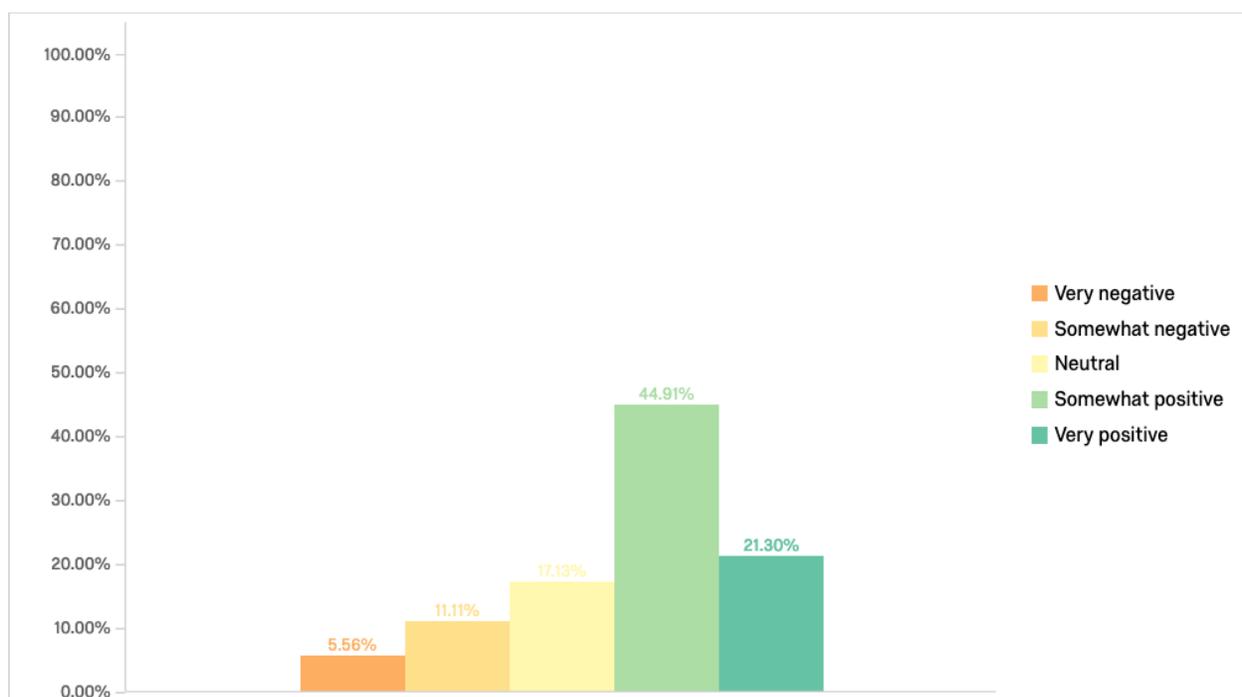
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## Difficulties with marking multi-phased peer review

A final drawback shared about peerScholar likely applies to any similar peer review tool: students would at times miss deadlines—*“people drop off at each stage”*—and therefore become excluded from later phases of the assignment. This sometimes led to challenges with marking, for example, *“if all feedback recipients forgot to complete this [feedback rating] phase, the original assessor received a grade of 0 for the quality of their feedback”*. Marks in these cases were *“corrected through post-processing”*, with instructional teams manually looking up and reading those students’ feedback submissions to determine their quality.

## Student response to using peerScholar

Student response to peerScholar overall was also largely favourable, with 66% of survey respondents reporting a positive experience, 17% neutral, and 17% negative (N = 216).



This trend largely held in the individual course contexts as well, with a higher number of positive responses in each and fewer neutral or negative (see [Appendix B.1](#) for graph).

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Course 5 had the only majority reporting a neutral or negative experience (about 30% and 27% respectively).

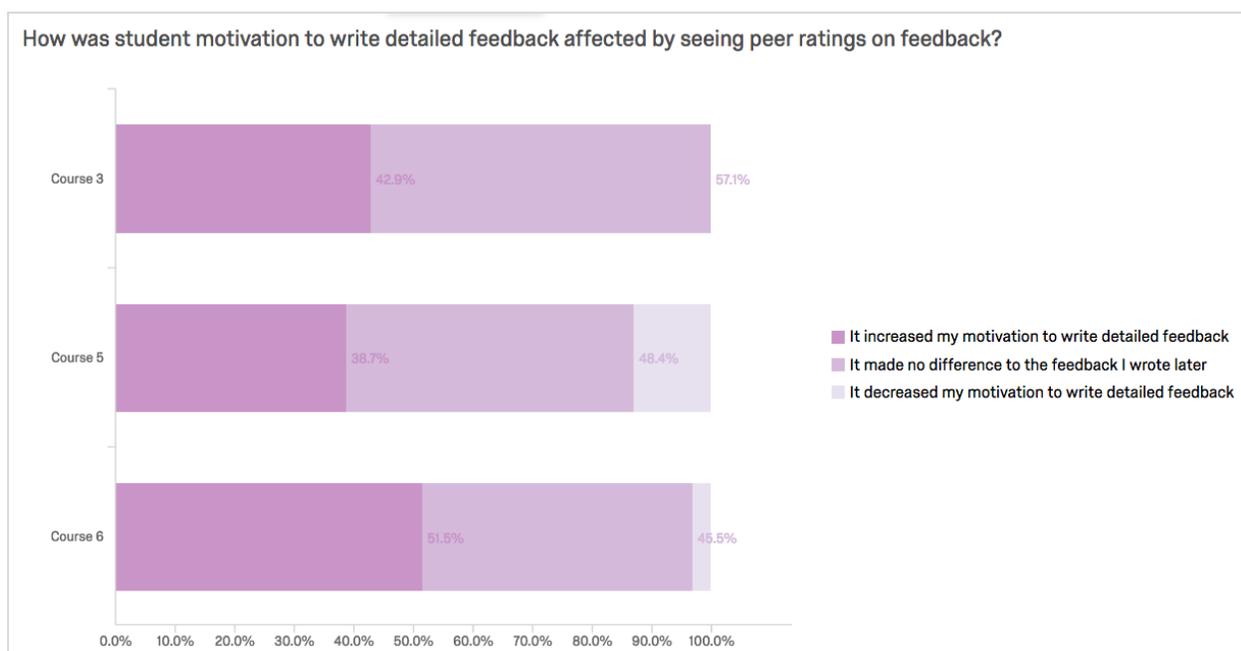
Student open-ended comments about the good and bad qualities of peerScholar primarily broke down into two main categories: those focusing on the peer review process and those about the application itself (see [Appendix B.2](#) and [B.3](#) for graphs).

### **Learning benefit perceived in using peerScholar for peer review**

In terms of the peer review process, some students felt peerScholar supported this well. It was *"a great way to have our work marked by other students, to see what improvements can be made"* and with feedback *"from not only one person but [multiple] peers"* that was received *"right away, instead of waiting [a] couple of weeks for the instructor to mark it"*. Additionally, it *"definitely aided in improving my constructive feedback"* given to peers, since *"I wouldn't have thought of the points/specific errors peerscholar asks you about"* in the instructor-set prompts, and these were presented simply as *"options that you could tick off"*. Finally, *"[reviewing] other people's work forced us to really understand the material"* and *"understand where they lack"* when looking at better peer submissions.

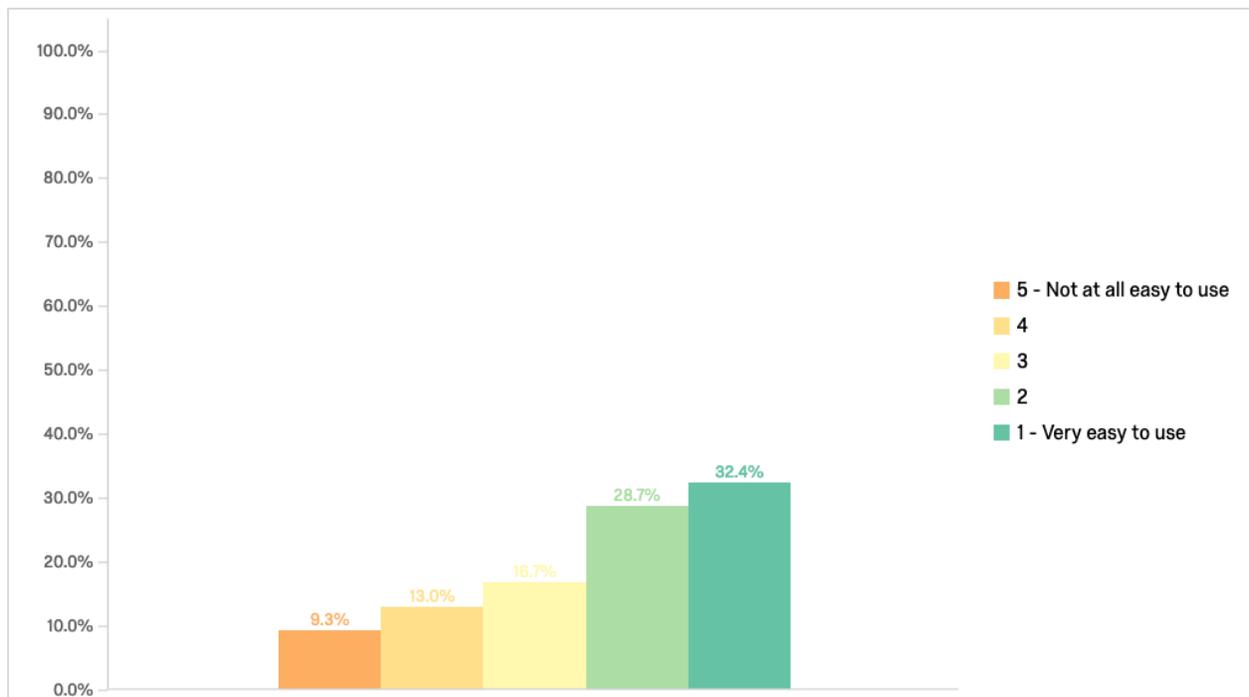
### **Feedback-on-feedback feature increased motivation for some**

As well, of the three courses that asked students about the effect of seeing peer ratings on feedback, more than a third of respondents in each (42.9%, 38.7%, and 51.5%) indicated an increase in their motivation to write detailed feedback.



## Application had good ease-of-use and useful features

Some students also commented positively about peerScholar’s general usability. Several respondents described it as “easy” or “easy to use”, with a subset highlighting the usefulness of contextual commenting specifically. This feature allowed students “to highlight exactly where I thought improvement was needed”, which in turn “allows the writer to see exactly what we are referring to when evaluating work”. The survey question specifically asking about ease of use also reflected a majority (61%) rating the usability more positively.



## Complaints about the quality of peer feedback

In contrast, other students brought up issues with the peer review process in peerScholar (though about 10% fewer than commented positively). In particular, some raised concerns with the feedback received, whether because *"I don't feel my peers gave me valid feedback"*, *"not all [comments] are constructive"*, or *"I am not sure if I would assess their evaluations as helpful"* to the original assignment. While not unusual for peer review generally, these sentiments were interesting in light of peerScholar's feedback-on-feedback feature. While it is possible peerScholar lessened overall student perceptions of receiving poor quality feedback<sup>7</sup>, it is also clear some students still felt dissatisfied by what their peers said.

## Desire to not just rate but comment on peer feedback received

Further, student frustration was heightened in those courses not allowing feedback receivers to comment directly to the feedback givers. *"I sometimes had problems with peers*

<sup>7</sup> It is outside the scope of this evaluation to comment objectively on the quality of the feedback received in peerScholar vs. through another peer review application. However, this would present an interesting research opportunity.

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*who said my assignment was incorrect, but in reality they are the ones who are incorrect” and yet “we couldn’t provide feedback for the advice we were given”; only a rating was possible. In Course 1 specifically, a few students added concerns about marks being partially assigned based on these inaccurate or inattentive peer reviewers, worrying that “very likely grades are dependent on luck and the mood of the person evaluating the work” and “I don’t think it’s fair”.*

## **Technical issues also impacted students**

But by far the biggest pain point reported by students was *“there were quite a few glitches in peerscholar”*. Like the instructors, students encountered numerous issues in accessing and using peerScholar throughout the term. Some of these apparently had to do with browser or platform incompatibilities, while others seemed independent of setup. Two of the most troublesome for students were peerScholar removing or unexpectedly altering the formatting of text-based submissions, which meant *“the submitted version of assignments have a different format than what we see before submission”*, and the previously noted issue with work being lost—*“it said that I didn’t hand in my assignment...but I did hand in the assignment”*, *“at times, changes that were made in the text box (prior to submission) would not properly save”*, and *“when I go back to check my [previously entered] comments they would all disappear”* (which this student added *“hindered some of the feedback that I wrote because I forgot”* what was entered the first time around). Other reported glitches included problems with rubric display, linking documents, and time zone settings<sup>8</sup>.

Still, it is notable, as one instructor stated, *“despite the glitches, even with that, the majority of [students] said we’d rather have this than not have this”* in the course. And a few students themselves made similarly optimistic comments about the future of the tool, rather than dismissing it based on the issues, e.g., *“hopefully this technical issue can be improved/fixed”*, *“if some problems get solved, I think PeerScholar is a good tool for students”*, and *“if you save the technical issues, I think it will be a great tool to use”*.

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<sup>8</sup> Again, from the LT Hub perspective, all these issues should now be resolved.

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## Recommendations

Based on this pilot's outcomes, these are some recommendations for how peerScholar could best be implemented at UBC to maximize its perceived benefits and minimize its perceived shortcomings.

### 1) Limit initial use to teams comfortable with evolving technology

<b>May address</b>	<ul style="list-style-type: none"><li>• <a href="#">Technical issues throughout pilot</a> (instructor issue)</li><li>• <a href="#">Technical issues also impacted students</a> (student issue)</li></ul>
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While peerScholar's development has likely been furthered since running this pilot, the stability of the current version is unknown. Due to the number of technical issues reported that significantly affected the workflow for instructors and students, it may be best for a wider rollout to start with instructional teams more comfortable with beta technology<sup>9</sup>.

### 2) Understand the current limitations with using groups

<b>May address</b>	<ul style="list-style-type: none"><li>• <a href="#">Technical issues throughout pilot</a> (instructor issue)</li><li>• <a href="#">Technical issues also impacted students</a> (student issue)</li></ul>
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One course in the pilot did successfully use peerScholar for group assignments<sup>10</sup>, but the application does not yet support one individual submitting on behalf of a group. Particularly in small courses that use group work, as one instructor put it, *"I'm not so sure that in small groups it makes things easier"* than simply exchanging paper, since there is a larger chance an individual will see the submission s/he contributed to (possibly even multiple times), without any functionality to limit reviewing to those outside the group.

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<sup>9</sup> And/or run significant testing within LT Hub to uncover more critical problems internally first.

<sup>10</sup> This was done using a workaround, where students each individually submitted the group assignment and, if shown their own assignment (as submitted by a teammate) to review, were expected to seriously review the assignment as if it were another group's.

### 3) Run test assignments before going live

<b>May address</b>	<ul style="list-style-type: none"><li>• <a href="#">Application enabled anonymous &amp; flexible peer review</a> (instructor benefit)</li><li>• <a href="#">Technical issues throughout pilot</a> (instructor issue)</li><li>• <a href="#">Limitations in using application's data downloads for marking</a> (instructor issue)</li><li>• <a href="#">Technical issues also impacted students</a> (student issue)</li></ul>
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A couple of instructors suggested new adopters run test assignments fully in peerScholar with instructional teams, instructional support staff, or student volunteers, not only to uncover possible technical issues but also to optimize their own review prompts. *"We tested out the rubrics separately" to "see how close or far away [testers] are in the scoring"*, with the results used to adjust what students would ultimately see and use as rubrics. Because *"if it's not set up well, students are going to hate it"* rather than learn from it, and with all the options available in peerScholar, it should be possible to set up any review clearly and effectively.

### 4) Plan how to deal with marking variations

<b>May address</b>	<ul style="list-style-type: none"><li>• <a href="#">Limitations in using application's data downloads for marking</a> (instructor issue)</li><li>• <a href="#">Difficulties in marking multi-phased peer review</a> (instructor issue)</li></ul>
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Since some student drop-off may be inevitable with a multi-phase peer review process, instructional teams should prepare to deal with variations in marking, particularly for larger courses where more students may be affected. One instructor suggestion was to use a minimum of three reviews per student (based on experience), because *"if there were 3 assessors, the number of people who nobody provides feedback to chances are slim"*.

Regardless of minimums set, teams still need to account for marking situations in which students receive little or no feedback on their initial submission (therefore decreasing the feedback they can rate, comment on, or incorporate into reflections or revisions) or receive fewer or no ratings on the feedback they leave (therefore impacting the system-generated score of their feedback's quality).

## 5) Enable (with commenting) and incentivize feedback-on-feedback

May address	<ul style="list-style-type: none"><li>• <a href="#">Feedback-on-feedback feature promoted quality feedback</a> (instructor benefit)</li><li>• <a href="#">Feedback-on-feedback feature enriched student learning</a> (instructor benefit)</li><li>• <a href="#">Feedback-on-feedback feature increased motivation for some</a> (student benefit)</li><li>• <a href="#">Desire to not just rate but comment on peer feedback received</a> (student issue)</li></ul>
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As noted earlier, many instructors came to find value in the feedback-on-feedback feature, both in helping encourage better student accountability in writing feedback and in adding another critical layer to the review process. Including this optional phase in peerScholar assignment setup is definitely recommended, as is allowing students to leave written responses (not just multiple-choice ratings) as part of this step. One instructor who did not require commenting on peer feedback in one assignment but added it later found *“if we force them into explaining why, that will help with the scores”*. In other words, requiring students to justify how they score a peer’s feedback seems to increase the score’s fairness.

Another instructor noted the importance of *“trying to incentivize”* the feedback further by adding marks specifically to this step. So it may also help to tell students they will be marked in part on how well their feedback is received by peers.

## 6) Clearly articulate peerScholar’s phases and process to students

May address	<ul style="list-style-type: none"><li>• <a href="#">Difficulties with marking multi-phased peer review</a> (instructor issue)</li><li>• <a href="#">Learning benefit perceived in using peerScholar for peer review</a> (student benefit)</li><li>• <a href="#">Complaints about the quality of peer feedback</a> (student issue)</li></ul>
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A few students in offering their own advice to peers brought up the importance of understanding and finishing all the assignment phases: *“don't forget when you have to complete all 3 steps”*. It may help for instructional teams to make sure students are fully aware of the different phases—e.g., *“I showed them a flow diagram”*—and related due dates, and for the first assignment, *“keep it low stakes”* and focus on *“just let's learn the system”* (as many instructors did for the pilot).

Additionally, five of the six courses included more general peer review training prior to the assignments, to explain how to approach these as well as *“why are they doing this”*. In

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Course 4, the instructor made sure this explanation also addressed *“the elephant in the room”*: the known downsides of peer review. In introducing the assignments, the instructor basically told students *“this is what the literature tells us [good and bad], and this is some things about peerScholar and how it will try to get the best out of the good and try to mitigate some of the bad experiences”*. This may have contributed to Course 4 having the highest positive response to the application.

## 7) Train students specifically in contextual commenting

May  
address

- [Application had good ease-of-use and useful features](#) (student benefit)
- [Complaints about the quality of peer feedback](#) (student issue)

Students noted the usefulness of contextual commenting but not all found this feature apparent at the start, with one student commenting, *“I had no idea we could annotate and leave comments on other people’s papers until I received my review back”*. Given the helpfulness for both the reviewer and reviewee, explicitly pointing out this option as part of the general orientation to assignments is advised.

Implementing peerScholar with these recommendations may help resolve some of the concerns brought forward by instructors and students and improve future users’ perceptions of the tool’s pedagogical value.

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# Appendices

## Appendix A - Instruments

### A.1) Instructor interview questions

1. What specific activities were given to students using peerScholar? Please include number, description, total peer submissions reviewed, review prompts, and if/how feedback was rated.
2. What were the main learning objectives of those activities?
3. How were the activities in the technology integrated into the course overall?
4. How were students introduced to, trained in, and followed up with on the activities done in the technology?
5. How were the activities in the technology graded? Please provide percentage breakdowns, if applicable.
6. How would you describe the quality of work students completed in the technology?
7. How effective or not was peer review in supporting your learning objectives? Why?
8. How effective or not was peerScholar in supporting peer review? Why?
9. On a scale from 1 to 5, with 1 being “not at all easy to use” and 5 being “very easy to use”, rate how easy or hard peerScholar was to use.
10. What were the main benefits of using peerScholar?
11. What were the main drawbacks or inconveniences of using peerScholar?
12. Have you used another learning technology that also support peer review? If so, how did peerScholar compare?
13. When you needed pedagogical or technical support with using peerScholar, how did you get it?
14. Would you like to continue using peerScholar for peer review? Why or why not?
15. On a scale of 0 to 10, with 10 being highest, how likely are you to recommend peerScholar to a colleague or friend for use in teaching and learning?

### A.2) Student survey questions

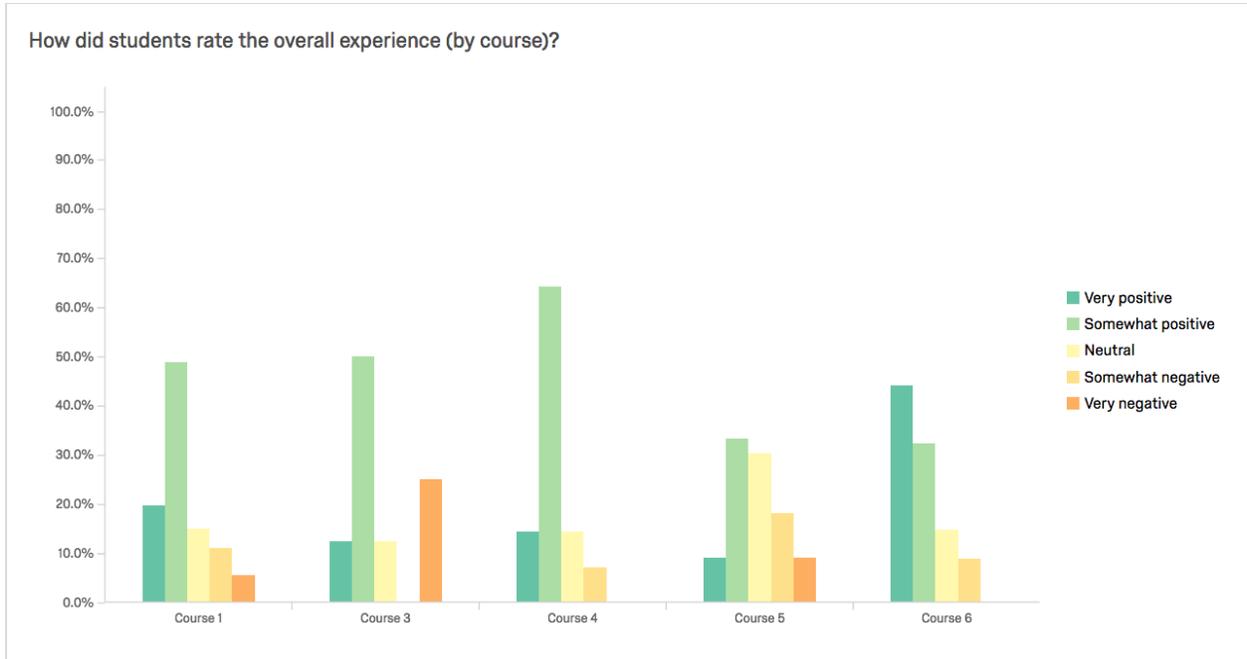
1. On a scale from 1 to 5, with 1 being “very easy to use” and 5 being “not at all easy to use”, rate how easy or hard peerScholar was to use.
2. What did you like and/or not like about using peerScholar?

- 
3. How would you rate your overall experience with peerScholar?
    - a. Very positive
    - b. Somewhat positive
    - c. Neutral
    - d. Somewhat negative
    - e. Very negative
  4. In the future, would you like to be given more or fewer of your assignments using peerScholar?
    - a. I would like more assignments in peerScholar
    - b. What was assigned was about right
    - c. I would like fewer assignments in peerScholar
  5. What advice would you give students using peerScholar to do peer review assignments next term?
  6. On a scale of 1 to 5, with 1 being “very useful” and 5 being “not at all useful”, rate how much or how little each of the following parts of the assignments contributed to your learning in this course.
    - a. Writing the initial submission
    - b. Reading peer submissions
    - c. Writing feedback for peer submissions
    - d. Reading peer feedback for your submission
    - e. Rating the helpfulness of peer feedback you received
    - f. Seeing the ratings from peers of feedback you gave
  7. How did you feel about the ratings you received on feedback you gave?
    - a. It increased my motivation to write detailed feedback to peers on the next assignment
    - b. It made no difference to the feedback I wrote later
    - c. It decreased my motivation to write detailed feedback to peers on the next assignment
  8. In the future, would you like to be given more or fewer of your writing assignments using the peer review process?
    - a. I would like more assignments to use peer review
    - b. What was assigned was about right
    - c. I would like fewer assignments to use peer review

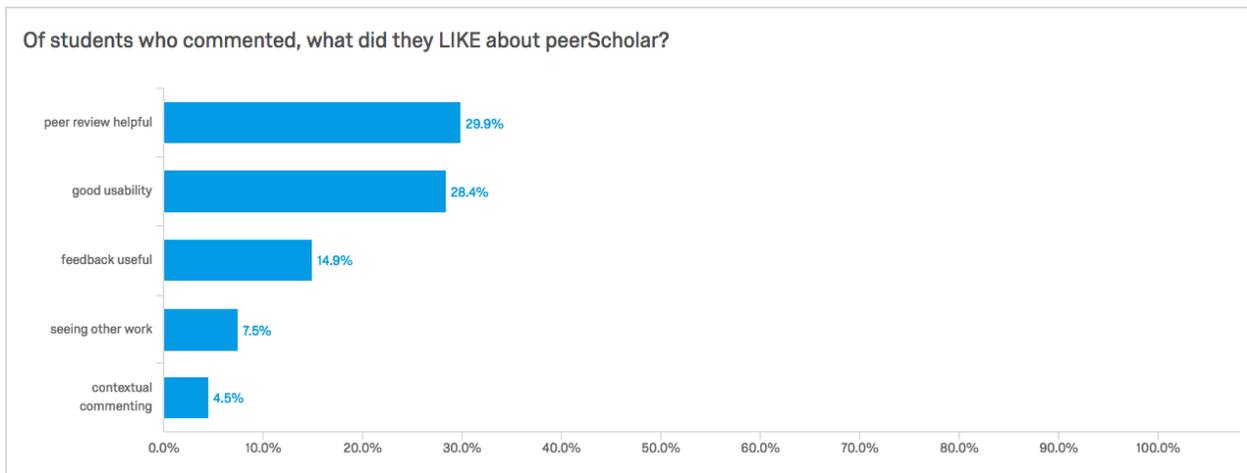
## Appendix B - Compiled Student Data

(See: [Qualitative codes](#) for these questions)

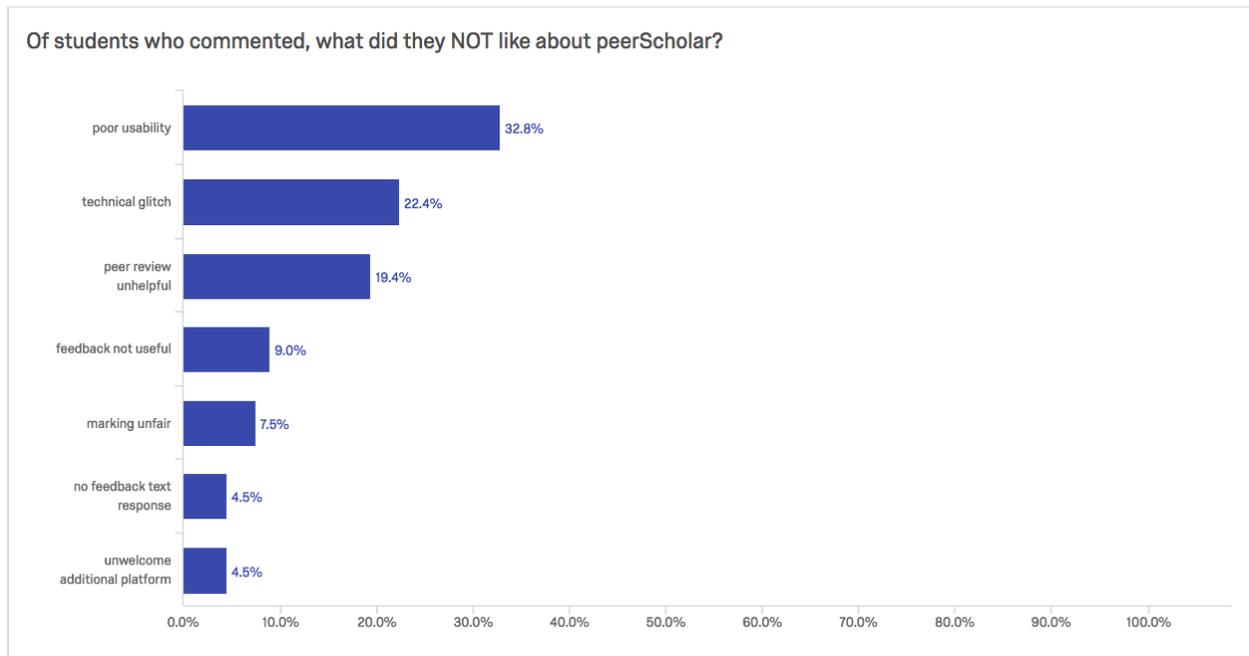
### B.1) Student Experience Ratings by Course (N = 216)



### B.2) peerScholar Student Comments - Benefit Themes (N = 67)



### B.3) peerScholar Student Comments - Drawback Themes (N = 67)



### B.4) peerScholar Student Perceived Usefulness of Assignments (N = 213)

