
Balancing Learner Experience and User Experience in a Peer Feedback Web Application for MOOCs

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Abstract

Educational technology practitioners at the University of Michigan created a web application called the Gallery Tool, which provides a space for learners to share their work and receive feedback on it. After piloting the tool in two online courses for seven months, we interviewed learners from these courses.

We found that learners most often used the Gallery Tool to “check all the boxes” of the course or to find inspiration for their own assignments. They liked its aesthetic and ease of use, but low levels of feedback activity decreased its value to them. As a result, it typically had a neutral impact on their course experience.

Our findings are most relevant to other educational technology practitioners, as they reveal insights for balancing and improving learner experience and user experience in web applications for massive open online courses.

Author Keywords

MOOC; LTI; learning experience design; peer assessment; peer feedback; learner experience

CCS Concepts

• **Human-centered computing~User studies** • Human-centered computing~Walkthrough evaluations • Human-centered computing~Field studies

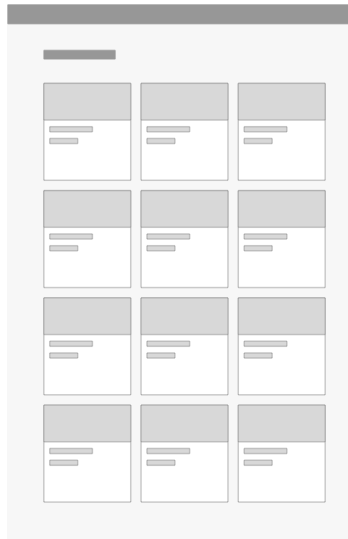


Figure 1: Learners can browse all submissions in the Gallery by visiting the All Submissions page (depicted in the mock-up above), which displays a grid of cards that each represent one submission. Cards include an optional cover image, submission title, one or more meta tags, a truncated description, publish date, and the number of views and comments it has received.

Introduction

Providing individualized feedback to tens of thousands of learners is a long-standing challenge for massive open online courses (MOOCs). Instructors seek a solution that is both easy to use and valuable for learners [3].

Peer-based assessment is one possible choice, but it comes with its own strengths and weaknesses. By providing an audience for the learner, it can increase his or her self-confidence, motivation, and quality of work [2]. Exposing learners to others' work and providing a way for them to interact with each other also affords new opportunities for self-expression and relationships [3]. However, unless learners receive training or guidance on how to give good feedback, their comments are not likely to be helpful [2]. Delayed feedback is also less effective than immediate feedback [4]. Finally, assignment complexity is also a factor: the more simple the assignment, the less important feedback becomes [1].

MOOC learning management systems (LMS) such as Coursera and edX support feedback at scale through internal peer assessment tools. They also facilitate learner interaction through discussion forums. However, some scholars consider these solutions to be rather limiting and call for alternative tools that "support learners in constructing artifacts and conversing with others about those artifacts" [7]. Others also make a case for separating feedback from grades after finding the former can either be interpreted as "grade justification" or ignored altogether [8] when the two arrive in tandem.

A literature search revealed the "Sharing Wall" as one pre-existing example of an alternative tool for displaying and discussing work [9]. Described as a "shared social space to gather and comment on resources," the Sharing Wall was built to give students visibility into each other's work as well as motivate additional practice and discussion. The pilot focused on

Higher Education educators. It received several favorable comments and sparked discussion in the course's forums.

To build on this work and experiment with a new way of facilitating peer feedback, a user experience designer (UXD) and software developer (SD) at the University of Michigan Center for Academic Innovation partnered with learning experience designers (LXDs), who specialize in online learning pedagogy and instructional design, to create the Gallery Tool. For learners, the application's core functionality includes a content-driven, highly visual, user-friendly interface for browsing submitted works (Figure 1); support for uploading various multimedia (such as text documents, images, and links); a learner-generated feedback question with each submission; a comment section on each submission page with guidelines for giving good feedback (Figure 2); and email notifications to signal when a submission receives feedback. In addition to the above features, instructors also have access to a configuration page where they can customize the Gallery Tool to best suit their use case (Figure 3). For example, instructors can pre-define two sets of meta tags which learners then apply to their submissions during the upload process and subsequently filter while browsing the Gallery.

The objective of this case study is two-fold. First, we will discuss our process of collaborating with learning experience designers (LXDs) to create and pilot the Gallery Tool. We will also reveal lessons we learned from balancing learning experience (LX)—a discipline focused on creating supportive experiences that facilitate learning and mastery of domain knowledge—with user experience (UX)—a field concerned with successful usage and pleasant experience [10]. Second, we will outline the steps we took to interview 18 learners from two pilot use cases and discuss insights for optimizing LX and UX in a peer feedback MOOC application.

Storytelling for Social Impact: Final Project Back to course

Home All Submissions My Activity Search for submissions Upload

Lorem Ipsum
by Sarah C. Edit

Non-Fiction Just Now

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nullam condimentum convallis nulla, nec varius tellus vehicula eget. Nulla cursus, ipsum eget pellentesque lacinia, leo enim scelerisque eros, a tempus augue lorem quis ipsum. Integer vel interdum ipsum. Vivamus laoreet velit nunc, sit amet imperdiet diam molestie vitae.

Attachments

LINK example.com

DOC example.doc

Questions for Reviewers

- Does the opening paragraph capture your attention well enough?
- Did you lose interest at any point? If so, where?
- How can I make the ending more complete?

Feedback (0)

Post Feedback

How to Give Good Feedback

- Avoid harsh or inappropriate language
- Lead with positive comments before giving constructive criticism
- Make sure your response is thoughtful (i.e., more than "Good job!")

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Figure 2: To view a submission, learners click on a submission card and arrive at the above detail page, which offers the same information as the card plus access to any attached files or links. At the bottom of the page is a section titled "Questions for Reviewers", which contains feedback questions written by the submission author that serve to guide peer feedback. Below it is a textbox that captures comments, and a list of tips for how to give good feedback.

Gallery: Milestone 1 - Project Brief, Work Plan, and Needs Finding Study Plan Admin

Home All Course Submissions My Submissions Search submissions Upload

2. Submission Categories and Topics

Use categories and topics to keep submissions organized and help learners find submissions that interest them.

Category label
Customize the text used to refer to a category in this gallery. Other examples include 'genre', 'theme', 'subject', etc.

Milestone

Category help text
Specify the help text that learners will see when selecting a category for their submission.

Select the milestone you are submitting.

Category choices
Specify up to 15 category choices for this gallery (categories, genres, subjects, etc.)

Milestone 1

Milestone 2

Milestone 3

Milestone 4

Figure 3: Instructors use the Configuration Form to customize their instance of the Gallery Tool. One way they can do so is by specifying two lists of words that become sets of meta tags. Learners then use those tags to categorize their submission and filter other works on the All Submissions page.

Methods

The following subsections describe our process and either reflect on the challenges we faced in that step or discuss what we might have done differently.

Gathering requirements with LXDs

The need for the Gallery Tool emerged from a conversation between LXDs and faculty of a developing MOOC by the University of Michigan, "Storytelling for Social Impact." For this writing-focused course, the instructional team wanted learners to engage in an ungraded, iterative peer feedback process on a final assignment. Given that the MOOC platform on which

the course would be hosted, Coursera, did not support this type of learning experience, they met with a UXD and SD in the same office to devise the Gallery Tool.

After learning more about the course and assignment from LXD, the UXD and SD had a clear sense of the project's technical and design requirements. Even in this early stage of the project, however, its design proved challenging. The established requirements met the needs of the use case at hand, but the team aspired to design a tool that would translate to other courses and assignments and was unsure if the current design would do so. Thus we partnered with LXD to identify places where the tool's LX would benefit from greater flexibility or customization, thereby leaving room for new and different use cases.

Designing with LXD

During the design phase of the project, LXD continued to participate in weekly meetings and served as advocates for the tool's LX. Our UXD assembled wireframes and then shared them with the team for feedback before making subsequent iterations.

During this phase, our UXD found it challenging to instinctively adopt a learner centered design (LCD) philosophy instead of a standard user centered design (UCD) mindset. UCD and LCD both aim to support task completion, but LCD does so in service of a higher goal: to increase knowledge [7].

Partnering with LXD through the design process helped the UXD overcome this challenge. As the mock-ups came together, the application started to look and feel like current social media websites, which initially led the UXD to follow the conventions of such sites and order Gallery submissions from most- to least-recent. After all, UCD best practices encourage designers to follow established conventions to maximize usability [5]. However, LXD pointed out this was not in the best interest of the learner. The Gallery Tool aimed to promote peer feedback, and the default content order

needed to support that objective. Thus we ultimately arranged content from most to least in need of feedback; submissions that were oldest and had the fewest comments were at the top, while those that had the most comments were closer to the bottom.

Adding new pilot use cases with LXD

Near the end of the tool's development, LXD identified two other courses in which it could be used:

- "Python Basics" - a programming MOOC which contained an optional practice assignment that asked learners to create a simple graphic using the Turtle library
- "User Experience Capstone" - the last MOOC in a five-part series in which students would complete various smaller assignments that built on one another and compile them into a finished prototype

The Python Basics instructional team wanted to encourage learners to complete the assignment and provide them with a place to showcase their work. The short and simple nature of the assignment, they felt, did not necessitate the formality of Coursera's built-in peer assessment tool. For these reasons, the Gallery Tool was a good fit.

Given that learners in the User Experience Capstone course would already have undergone peer review for similar assignments in previous courses, the instructional team wanted to avoid Coursera's peer assessment process for the final project assignments. They were also interested in providing learners with a mechanism for browsing and viewing their peers' work, which the Gallery could easily provide.

Despite the Gallery Tool's ability to meet these use case's basic needs, neither was a perfect fit. Both of them primarily sought to use the tool for showcasing work rather than its original premise of facilitating peer feedback. The team was concerned, therefore, that the

feedback-related aspects of the Gallery would confuse or frustrate learners. We realized at this point that we may have created a tool that provides a flexible UX (i.e., customizable tags) but the LX it supports might not be equally so. Ultimately, the team determined the advantages of using the Gallery Tool outweighed disadvantages, and decided to pursue the new pilots.

Conducting and analyzing learner interviews

Seven months after the initial pilots began, learners in the Python Basics and User Experience Capstone courses were using their Galleries much more than those in Storytelling for Social Change. We therefore decided to only interview Python Basics and User Experience Capstone learners to find out:

- a) Since participation in the Gallery was optional, what motivated them to use it?
- b) What did they like most about it?
- c) What did they like least about it?
- d) What did they think about the feedback-focused nature of the tool?
- e) What impact, if any, did this tool have on their experience in the course?

The UXD emailed 100 Python Basics and 13 User Experience Capstone learners who submitted work to their respective Gallery in the past month (May 15 and July 17, 2019). He invited them to participate in a 30-minute video call in exchange for a \$10 Amazon gift card. Twelve “Python Basics” learners and 6 “UX Capstone” learners responded. Interviewees resided in the United States (10), Russia (2), India (2), Guatemala (1), Australia (1), South Africa (1), and Switzerland (1). We did not collect other demographic data.

The UXD conducted the interviews over a period of 2 weeks via Google Hangouts. Each interview lasted between 15 and 35 minutes. He used Otter.ai to transcribe all interview audio recordings.

The UXD then partnered with a user experience researcher to code the transcripts. They:

1. Individually read and noted themes for a single transcript
2. Compared observations and created a mutually understood set of codes
3. Individually applied the codes to a new transcript
4. Compared selections, refined the set of codes, and confirmed shared understanding of them
5. Read and coded 9 interviews each, including those previously used to establish the codes
6. Compiled code selections in a Google spreadsheet and synthesized key takeaways through informal discussion

If we were to do these interviews again, we would have added more LX-focused questions, as the majority of our protocol contained neutral or UX-specific questions. For example, asking learners “Is there anything you particularly like about the Gallery?” elicited a mixture of LX- and UX-related responses. To ensure a better balance of LX and UX findings, in the future we plan to ask more distinct questions such as: “Did anything about the Gallery help you learn better? Is there any functionality in the Gallery that you particularly enjoyed using?”

Findings

The following section presents our learner interview findings.

Learners used the tool for inspiration

Since participating in the application was optional, we originally expected learners to use it primarily out of a desire for peer feedback. As it turned out, they used the tool for two other reasons instead: 1) they were being thorough in their completion of the course and 2) they were looking for inspiration:

L2: ...my second goal [for using the Gallery was] to find

When asked what they liked most about the application, learners most commonly listed the tool's clean and pleasing design, as well as the ability to see how many people had viewed or commented on a submission. They also praised the tool's ease of use, which allowed them to achieve their higher goal of finishing the course:

L5: It didn't cause any frustration or confusion on my part. So it allowed me to move on fairly quickly.

Learners perceived the activity level in the tool as low, which demotivated them to use it
Among the aspects of the Gallery Tool that they disliked, several learners stated it felt inactive:

L16:

Learners' observed lack of feedback activity on submissions then caused them to value the tool less:

Learners were confused and annoyed by the feedback-focused features
When asked about the feedback-related features of the tool, such as the requirement to include a question about their work for reviewers to answer, learners said:

L18: Like, it's good but I don't think it should be required. What's the need? I don't understand this.

L14: I did find that mildly annoying. I submitted this to the Gallery and really didn't ever have any plans on

revisiting that particular upload. So I posted a comment rather than a question, [which] didn't serve me any purpose.

The Gallery Tool had a neutral impact on learners' course experience

When asked how the tool impacted their experience in the course, learners offered a vast range of responses. Some stated the tool was not of use or interest to them. Others felt neutrally, since it pertained to an ungraded assignment. And some said it had a positive effect on them because it motivated, challenged, or inspired them:

L16: It challenged me to make something like big, not like a simple shape.

Discussion

This section comprises LX- and UX-related insights we gained from designing the Gallery Tool in partnership with LXDs and interviewing learners who used the tool.

Give-and-take

Collaborating with LXDs in the design phase revealed several ways that the tool's UX could adjust for a better LX, such as ordering content from most to least in need of feedback. In this way, the Gallery Tool maintained a pleasant UX while better serving the unique needs and goals of the desired LX. Thus we look forward to working with LXDs on future projects and recommend that other designers and developers in the educational technology space do the same. However, learner interviews reminded us that one can also optimize an educational tool's LX without changing the interface or functionality:

L1: I don't think [the lack of feedback being given] is a problem with the tool itself, you know, it's very easy to add a comment. But no one's doing that. I think that might be a mistake on the part of the course itself. You know, saying that it's optional to even post [a submission], let alone, you know, make comments on it.

It's all in the timing

Learners were quick to undervalue or abandon the tool when it did not appear active or provide timely feedback. To improve these aspects of the Gallery's LX, we are considering technical and nontechnical adjustments to it. One way to encourage activity could be to send email notifications after a learner has submitted content to the Gallery Tool, prompting them to return and leave feedback for someone else. A non-technical solution could be to employ Gallery moderators who provide immediate feedback and stimulate discussion.

Good UX is about invisibility, good LX is about value

Several learners stated their primary goal in using the Gallery Tool was to "check all the boxes" and complete the course as quickly as possible. In extreme cases, learners planned to complete the entire course in a week or less. For UXDs and SDs creating educational technology, this should stress the importance of usability. Given learners' ulterior learning goals and the pace at which they seek to accomplish them, educational technology should be so easy to use that even the biggest UX choices go unnoticed to the learner. Learners' use of the system should be seamless.

The system's LX and the value it offers learners, however, should be readily apparent. Some of the learners we interviewed questioned why the Gallery Tool was being used in their course. It was easy to use, but it was not *useful*. This sentiment stemmed from a perceived lack of activity in the Gallery, lack or delay of feedback, or confusion regarding the tool's feedback features. For UXDs, SDs, and LXDs alike, the lesson we

learned is that it must always be clear to learners what they will get out of using a piece of educational technology. LXDs can communicate this by stating it explicitly when introducing the tool in the course. And UXDs and SDs can support this by designing and building the tool to serve the learner's educational goals, not just their usability needs.

Maximize configuration

Early on in our design process, we realized the tool needed to be customizable in order for it to be reusable. However, we did not fully anticipate the breadth of use cases we would encounter, such as those focused more on sharing work than facilitating feedback. In these cases it would have been ideal to declare the feedback-related aspects of the tool as optional instead of required. The takeaway for UXDs and SDs working with educational technology, then, is that for educational software to be truly reusable it must offer maximum configurability. Anything that is unchangeable across uses imposes potential limitations.

Conclusion

This case study reflects on the process of balancing learner experience and user experience while designing and developing a peer feedback web application for MOOCs, the Gallery Tool. The tool we created provides a space for learners to share their work and engage in peer feedback. It was designed to accommodate a variety of courses and assignments. After piloting the tool in three MOOCs, we interviewed learners from two of those courses to find out why they used it, what they liked and disliked about it, what they thought about its peer feedback components, and what impact it may have had on their MOOC experience.

Collaborating with learning experience designers throughout the design and planning stages of the project resulted in the tool being more flexible and learner-centered. But interviews revealed learners did not use the tool as we had expected. Rather than to

receive peer feedback, learners used the Gallery to either thoroughly complete the course or as a source of inspiration for their own assignment. Learners praised the tool's usability, but were demotivated to use it after perceiving a general lack of activity within it.

Creating and evaluating the Gallery Tool revealed valuable lessons for ed tech practitioners: 1) both user experience designers and learning experience designers play a role in optimizing educational technology's learner experience; 2) a sense of activity can make or break learners' motivation to engage in optional educational tools; 3) the rapid pace at which learners sometimes progress through an online course leaves little room for UX problems, and holds the LX of any additional tool to an equally high value standard; 4) it's possible to create reusable educational technology, but it must maximize configuration options to be most effective.

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References

- [1] Robert L. Bangert-Drowns, Chen-Lin C. Kulik, James A. Kulik, and MaryTeresa Morgan. 1991. The Instructional Effect of Feedback in Test-Like Events. *Review of Educational Research* 61, 2 (1991), 213–238. DOI: <https://doi.org/10.3102/00346543061002213>
- [2] Mohammed Farrah. 2012. The Impact of Peer Feedback on Improving the Writing Skills Among Hebron University Students. *An-Najah University Journal for Research - Humanities* 26 (2012), 179–210.
- [3] Hanan Khalil and Martin Ebner. 2014. MOOCs Completion Rates and Possible Methods to Improve Retention - A Literature Review. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2014*, (2014), 1236–1244.
- [4] James A. Kulik and Chen-Lin C. Kulik. Timing of Feedback and Verbal Learning. *Review of Educational Research* 58, 1 (1988), 79–97. DOI: <https://doi.org/10.3102/00346543058001079>
- [5] Jakob Nielsen. 1994. 10 Usability Heuristics for User Interface Design. <https://www.nngroup.com/articles/ten-usability-heuristics/>
- [6] Chris Quintana, Joseph Krajcik, and Elliot Soloway. 2000. Exploring a Structured Definition for Learner-Centered Design. In *Proceedings of the Fourth International Conference of the Learning Sciences*, (2000), 256–263.
- [7] Elliot Soloway, Mark Guzdial, and Kenneth E. Hay. 1994. Learner-Centered Design: The Challenge for HCI in the 21st Century. *Interactions* 1, 2 (1994), 36–48. DOI: <http://doi.acm.org/10.1145/174809.174813>
- [8] Jody S. Underwood and Alyson P. Tregidgo. 2006. Improving Student Writing through Multiple Peer Feedback. *Journal of Teaching Writing*, (2006). https://library.wvu.edu/files/wis_tla/UnderwoodTregidgo.pdf
- [9] Steven Warburton and Yishay Mor. 2015. A set of patterns for the structured design of MOOCs. *Open Learning: The Journal of Open, Distance and e-Learning* 30, 3 (2015), 206–220, DOI: <https://dx.doi.org/10.1080/02680513.2015.1100070>
- [10] Margaret Weigel. 2015. Learning Experience Design vs. User Experience: Moving From "User" to "Learner". (2015).