WHITE PAPER

Surveying TA Attitudes Toward Labflow

Gain important insights into the needs and trends of our TA user base, TA perceptions of Labflow, and how our platform can support your course.

labflow

AUTHOR
DANE DESUTTER, PH.D.

Overview

At Catalyst Education, we are committed to making the Labflow platform work for everyone. Any software company continuously improving their product knows that engaging customers regularly to understand their needs and designing (and redesigning) features to make their jobs easier is essential work. Focusing solely on the end customer, however, would blind us to the importance that graduate and undergraduate teaching assistants (TAs) play in the facilitation of most lab courses.

TAs are in a unique position because in many lab programs—especially those that are larger—they serve as the cornerstone of the educational experience. They run the day-to-day lab experience from smoothly facilitating an experiment through grading and assessing student work. This positions TAs as a vital link in the Labflow product given their direct impact on students and the broader lab experience.

Following some important insights from a pilot survey in spring 2021, we have made the TA survey a regular feature of our user research and product improvement cycle. We launched this short 12-question survey

at two large urban research-intensive universities in the southern United States. Using the Carnegie classification scheme, both of these universities are considered large enrollment institutions (>15K). Both use graduate TAs to manage the implementation of laboratory courses for large numbers of students from diverse disciplines within the science, technology, engineering, and mathematics (STEM) constellation.

The research questions that guided the design of this survey were selected to focus on the experience of the TA with Labflow:

1. How does Labflow integrate with teaching assistants' workflow?

2. What perceptions do TAs hold of Labflow?

In this white paper, we will highlight a subset of the results from this survey and provide some high-level takeaways about what this might mean for you and how Labflow can support your course. Each high-level question will be broken down into smaller sub-questions that help build out a rich picture of the trends and needs of our TA user base.

QUESTION 1

# How does Labflow integrate with teaching assistants' workflow?

One important question driving this research is to better understand how Labflow is a part of teaching assistants' existing practice. To answer this broader research question, we polled TAs on their use of specific features in Labflow and analyzed these responses to look for clear trends in behavior. This specifically involved asking TAs to self-report which interface components they use most frequently and to what extent Labflow saves them time while doing their jobs.

## What features do teaching assistants leverage when grading in Labflow?

Grading is a substantial obligation for TAs in lab courses. Labflow offers a number of interfaces to view the data entered by students ("Review" tab) and assess them either report by report ("Grade" tab) or at the item level ("Quick Grade" tab).

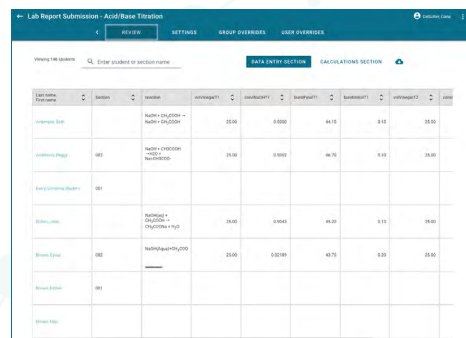**Q: When grading in Labflow, how frequently do you use each of the following grading features?**

We found that the **overwhelming majority of TAs reported using the Quick Grade tab.** Interestingly, we observed that this preference was independent of teaching experience: Whether or not a TA had some prior experience teaching, Quick Grade was the preferred feature for grading student work.
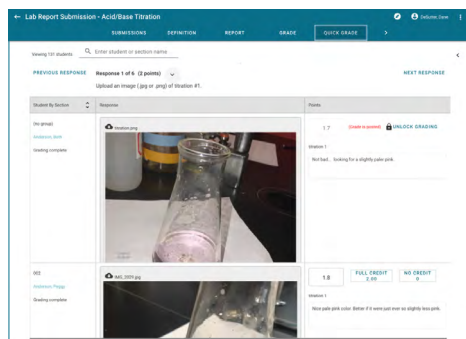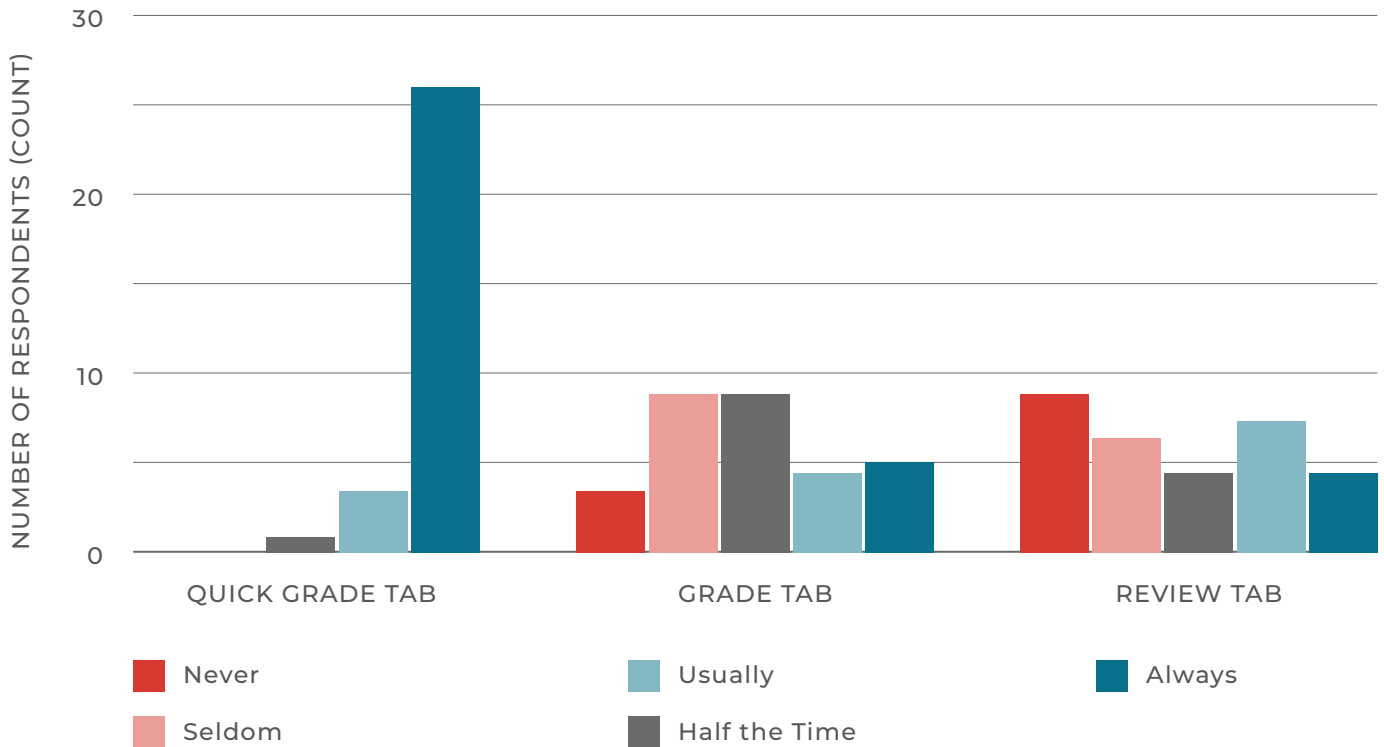

QUICK GRADE TAB
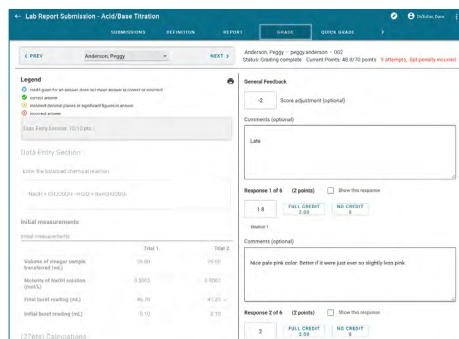
GRADE TAB

REVIEW TAB

FIGURE 1
Self-reported frequency of use for each component of the Labflow grading interface

The Quick Grade tab gives each TA the ability to grade at the item level across all of their students and apply a consistent grading methodology to that item independent of the specific student being assessed. This is important because it improves grading consistency—after all, many lecture courses grade their exams this way for the same reason—and the data indicates that Quick Grade fits naturally into the grading behaviors of new and experienced TAs alike.

What features do teaching assistants leverage when grading in Labflow?

Time savings is frequently identified as a crucial concern at all levels of a laboratory course: students want feedback on their work to know how they're doing; TAs want to get their grading done quickly so they can focus on their research projects; lab coordinators want to see how a course is progressing with regular feedback from their graders. We asked TAs first to report how long they are grading in our system.

Q: Approximately how many hours per week do you spend grading in Labflow?

Respondents reported spending a median of 3–4 hours grading student work each week. If we loosely estimate that TAs spend 10 hours per week grading on a 50% appointment, this indicates a significant reduction in grading time on average.

FIGURE 2
Estimated number of hours that TAs spend grading student work each week in Labflow

1-2 hours	5-6 hours	9-10 hours
3-4 hours	7-8 hours	11-12 hours

![CATALYST Education logo]
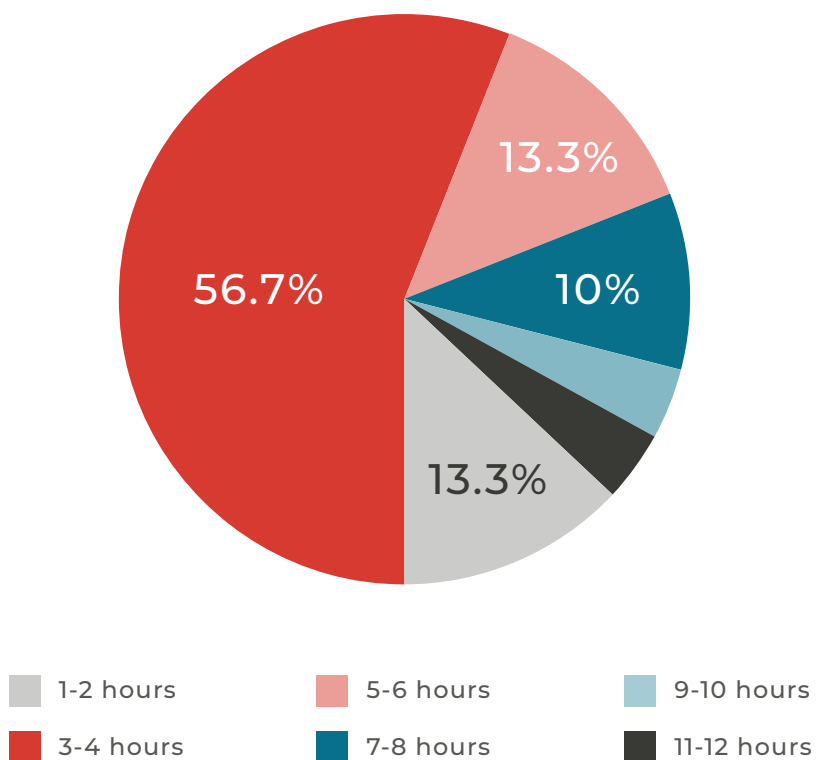
QUESTION 2

What perceptions do TAs hold of Labflow?

In addition to addressing how TAs use Labflow, we also wanted to know what features of the platform they enjoy and which they think could be improved to better support their jobs. We wanted TAs to feel free to provide us with some anecdotes of using the system and tell us about times when it worked for them and when it didn't. The goal of this was to get a more qualitatively rich picture of user experiences and satisfaction and identify pieces of the puzzle that we might be missing.
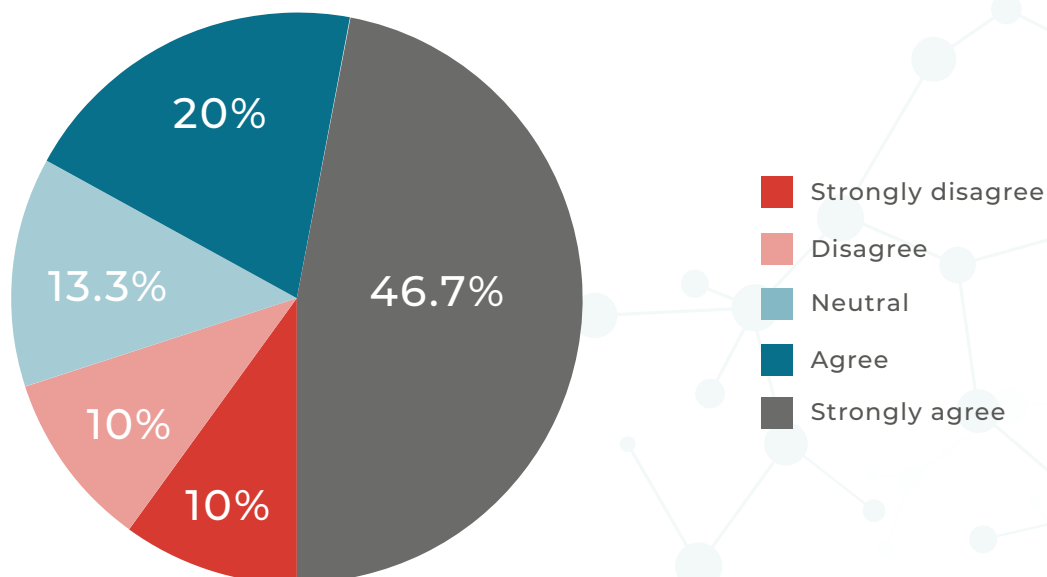
What user experiences do TAs report in Labflow, and to what extent do user experiences impact TA perceptions?

Q: Evaluate the following statement: Labflow saves me time while grading.

We found that **66.7% (± 8.6%) either agree or strongly agree that Labflow saves time grading.** This baseline establishes clearly that TAs know that grading is quicker in Labflow. **Experienced TAs were especially likely to rate this statement highly,** which indicates that grading is far more streamlined when contrasted against more traditional grading setups.

FIGURE 3
Proportion of responses on a 5-point Likert scale evaluating the extent to which they agreed that "Labflow saves me time while grading"

Legend:
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Pie chart values: 20%, 46.7%, 13.3%, 10%, 10%

We also found that TAs were net promoters of the platform, with a score of 23. Interestingly, we observed that a significant factor driving net promoter responses was whether a TA reported that Labflow saved them time while grading. This indicates that grading and the ease of doing so is a major factor that drives TA satisfaction.

FIGURE 4
Comparison of whether TAs would recommend Labflow to a friend or peer against whether Labflow saved them time on grading student work
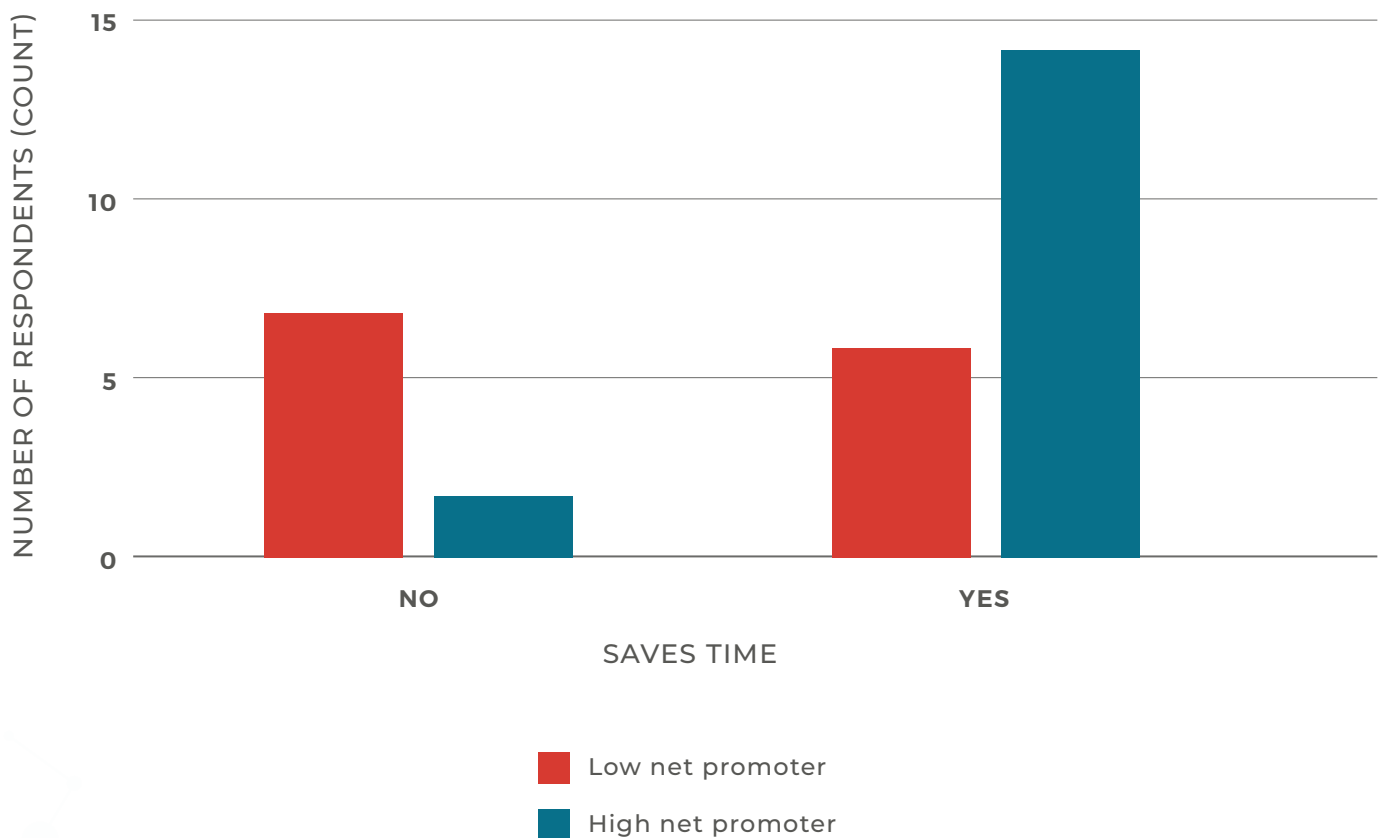
Q: Describe one positive experience and one negative experience you had using Labflow.

In addition to asking narrowly defined questions about user experience, we included a freeform response to capture experiences and user frustrations that we may not be aware of among our TA users. We found a number of highly interesting insights from this question, in particular further coordinating evidence that **grading is the overwhelming factor that affects TA user experiences**.

TAs spoke very positively about two specific feature instances of grading in Labflow: the **Quick Grade tab and report autograding.** It was already clear from questions about the workflow that TAs frequently used Quick Grade to carry out their work. Here we see why: They choose Quick Grade because they found it convenient and easy to use, supporting a positive user experience.

FIGURE 5
Frequency of coded features that impacted TA user experience (top) and proportion of specific feature instances that were mentioned in conjunction with positive and negative user experiences (bottom)
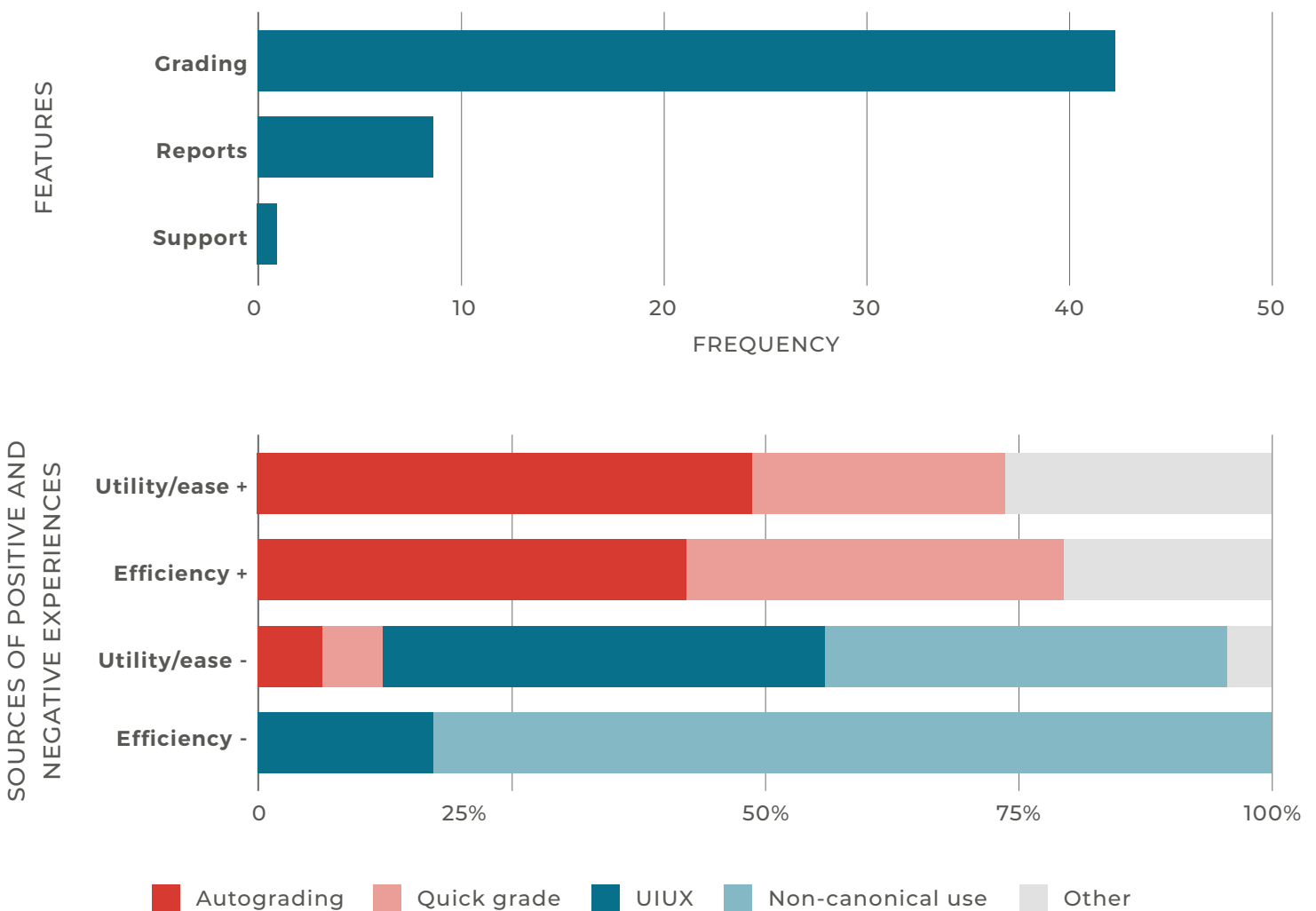
What also appeared equally strongly in positive user experiences was the presence of autograding functionality in reports. Autograding is one of the hallmark features of Labflow and can be readily included in almost any type of report. When a report is authored in Labflow, it can be designed with sophisticated grading rules that maximize the number of items that can be scored as soon as a student submits their work.

The sophistication of autograding is responsible for this satisfaction: Autograding takes in students' own data and passes it through calculated components of that report's analytic writeup. Autograding logic can be as simple as multiple choice dropdowns up through sophisticated numerical analyses like linear regression and observation-based grading. Autograding serves as a logical driver of time savings—the fewer numeric items that a TA has to grade, the quicker it is for them to do their work.

We were also interested to know what aspects of Labflow TAs indicated did not sufficiently support their workflow. The codes applied to TA's negative user experiences revealed two principal categories: (1) user interface and user experience (UI/UX), and (2) non-canonical use of Labflow activities in a course.

UI/UX is a frequent target for continuous improvement for software companies. While TAs expressed much positive sentiment about grading in Labflow, a significant cross-section also desired changes to the layout in specific grading pages to make it easier to locate student responses. Another refrain was the desire to maximize the available screen real estate for viewing student work. We are following up on these UI/UX comments through user interviews and will identify design features to address these concerns.

The second category of negative user experiences was something that we had not anticipated going into this survey. What we are calling "non-canonical use" is an umbrella term for the use of Labflow to manage aspects of grading in a course that it was not explicitly designed to accommodate. In this particular instance, TAs were asked to enter grades for an activity that took place outside of Labflow using a shell activity that would then be posted to the course gradebook. This required TAs to make a number of extra clicks when submitting grades. We learned that additional steps in the grading process lead to delays and dissatisfaction. An important lesson from this feedback is that we should coach instructors away from uses of Labflow we haven't tested thoroughly—especially when it negatively impacts grading practices.

What does this mean for me and my course?

This survey has been illuminating not only in foregrounding how teaching assistants use Labflow and their perceptions of the product, but it also highlights the factors that affect the work of TAs in laboratory courses more generally. Perhaps unsurprisingly, grading student work and the time that this takes are both key concerns for TAs. From our experience, these are not unique issues that affect our TA users but represent part of the difficulty of being in a teaching assistant role at any university.

Labflow was designed from the ground up to make grading quicker and easier. With much-loved features like Quick Grade and autograding, not only does this make TAs' work easier, it also provides highly consistent grading experiences for students. Our team of expert designer-scientists has extensive experience converting traditional lab reports into a Labflow equivalent. Whether you decide to have us convert your existing experiments into Labflow reports or leverage our excellent library of open education resources (OER) lab manuals, we can bring grading consistency and grader satisfaction to your course.

If you would like to see how Labflow can improve your course, please schedule a demo by booking an appointment.

DANE DESUTTER, PH.D.

Dane is a learning scientist, data scientist, and software developer at Catalyst Education. His prior role as a postdoctoral scholar at the University of Illinois-Chicago included building the web-based Connected Chemistry Curriculum pedagogical simulations and developing machine learning approaches to studying student cognition. His research has broadly focused on using laboratory and design-based research methods to understand and improve student learning processes in university science settings.