

## What this is

*The Innovative Instructor* is an article series (<https://cer.jhu.edu/ii>) and a blog (<https://ii.library.jhu.edu>) related to teaching excellence at Johns Hopkins

## Article categories

### Best Practice

How to use technologies and apply innovative instructional methods

### Pedagogy

Hopkins professors share successful strategies for teaching excellence

### Technology

Information about emerging technologies, who is using them, and why you should know

For information on how to contribute to *The Innovative Instructor* or to read archived articles please visit:

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## About the CER

The Center for Educational Resources partners with faculty, postdocs, and graduate students to extend instructional impact by connecting innovative teaching strategies and instructional technologies

Center for  
**Educational  
Resources**



## Gradescope

Reid Sczerba, Multimedia Developer, Center for Educational Resources

### What it is

Gradescope is a grading platform for course assignments and exams. It is used by instructors and teaching assistants to make the grading process more efficient and consistent, providing quality feedback for students regardless of the size of the course. It can be used to grade existing paper-based assignments and exams or to create a variety of online assignments, including bubble-sheet and programming assignments.



to give students the opportunity to engage with the instructor or teaching assistants but it may not scale well to provide tailored guidance for hundreds of students each semester. In addition to the time-saving features available to instructors, Gradescope also includes robust methods to administer specified feedback to students. Not only will students have a better idea of why they received a certain

grade but instructors will also have metrics on each student's performance recorded in Gradescope. This can maximize time spent during office hours with each student.

Typically, larger classes rely on teaching assistants (TAs) to aid with the facilitation of a course. When it comes time to grade exams and large homework assignments, instructors frequently arrange "grading sessions" with all of their TAs. To keep grading consistent during these sessions, the instructors will often establish a rubric for grading and have TAs review certain questions. In Gradescope, this can all be done online with accurate tracking of who graded which exam as well as data showing exactly how the grade was determined. When grading exams in Gradescope, you establish "rubric items" that make up the total points that can be received for each question. This gives each TA clear guidance on how to award points for each question. On the student side, they can see exactly how points are deducted and even send a regrade request directly to the TA or instructor who graded their exam.

### Who produced it

Gradescope began as a startup company in 2014, founded by a group of graduate students at the University of California, Berkeley. While teaching a course in computer science on artificial intelligence (AI), the students developed a way to utilize AI to improve on the grading process. In 2018, Turnitin, a plagiarism detection and written assignment feedback application, acquired Gradescope. With the support of Turnitin, Gradescope will continue to expand on its features.

### Why it was made

Grading is one of the most time consuming aspects of teaching, especially in large introductory courses with hundreds of students. The creators of Gradescope saw an opportunity to innovate in education by leveraging artificial intelligence assisted methods to hasten the grading process. Using this computational power paired with a simple user interface, Gradescope allows faculty to spend less time grading and more time giving students meaningful feedback to keep them on track with their learning goals.

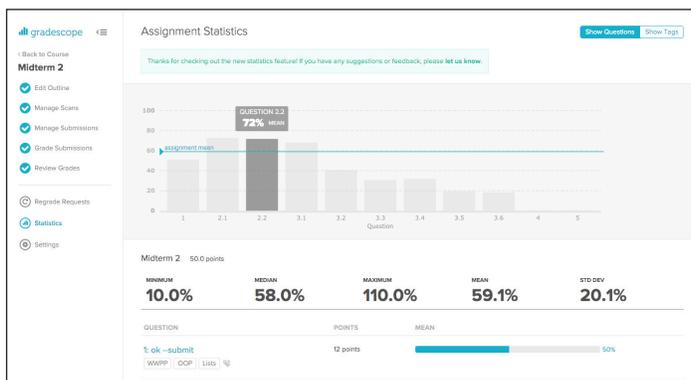
### Why it matters

As enrollment increases across disciplines and various demands pull on instructors' time, being available for students can become difficult. Faculty conduct office hours

### How it can be used

Gradescope is a tool to facilitate the grading of existing paper-based assignments and exams. Its basic use case requires an upload of a PDF of a problem set or questions; most of the time, this will be a scanned copy of a blank assignment or exam. This becomes the template for establishing question regions where the application can expect to present the answers to the grader. When

Example of grading a submission and setting Rubric Items



Example of Assignment grading statistics for a question

PDFs of scanned student submissions are uploaded (either by the students themselves or the instructor), Gradescope collates the answers for each question according to question regions established in the template. As Gradescope presents each student submission, the instructor creates Rubric Items, including descriptions and point values, to assign or reduce points from the grade. These Rubric Items can be consistently used each time a question is graded to provide meaningful feedback to students when grades are released and establish useful insight on student learning through statistics from semester to semester.

online assignments and bubble sheet assignments that will automatically grade to an answer set to make grading more efficient.

One of the more impressive features is the programming assignment auto-grader. Gradescope sets up a mini virtual server where an instructor can install the packages and libraries necessary to grade programming assignments. Once the environment is set up, the instructor establishes programmatic tests that will automatically compile student submissions and assign grades according to the test criteria.

Over the following year, the application was introduced to more of the Arts and Sciences instructors to help increase adoption at JHU. Physics and BioPhysics were the first departments to start using Gradescope for midterms and assignments throughout the semester. Instructors from the Physics department greatly appreciated the efficiency it offered them; they even opted to purchase a 400 page paper cutter to streamline the scanning procedure for student exams in the General Physics course.

One of the innovative ways that Gradescope utilizes AI is through its AI-assisted grouping of submissions. This feature automatically groups together submissions that are similar in appearance. This works best with multiple choice questions, short text answers, equations and diagrams. Once submissions are grouped together, the instructor or TA can grade each grouping instead of each individual submission. Gradescope has also created

## Who is using it

Initial adopters at Johns Hopkins University from the Computer Science department mainly utilized the auto-grading programming assignment features. They quickly discovered that despite the extra time it took to create the auto-grading scripts, they were able to exponentially save time on grading. A few instructors even decided to extend their office hours to increase engagement with their students.

## Where it is going

Gradescope has been very responsive to user feedback. The company publishes its development roadmap on a Trello board for anyone curious about what new features are in the queue. Gradescope prides itself on excellent customer service, ensuring that assistance is available for any questions or issues that may come up. Now that it falls under the Turnitin company structure, Gradescope anticipates an increase in resources to further improve the already high-quality service and features.

## Additional Resources

- Gradescope: <https://www.gradescope.com>
- Gradescope development roadmap on Trello: <https://trello.com/b/36UN761q/gradescope-roadmap>
- Gradescope Auto-grader Documentation: <https://gradescope-autograders.readthedocs.io/en/latest>

## Author's Background



### Reid Sczerba, Multimedia Developer, CER

A staff member at the Center for Educational Resources, Reid provides training on a variety of programs, aids in educational resources development, and shares expertise on information and graphic design with faculty at the Homewood campus. He holds a BFA in Illustration and a MA in Digital Arts from Maryland Institute College of Art.

## How to get started

JHU has an institutional license for Gradescope, which provides access to Blackboard integration (roster sync and grades export), AI-assisted grading, and the programming auto-grader. To gain access to these features, you must register at Gradescope's website (<https://www.gradescope.com>) using your JHU email address. If you would like to use the Blackboard integration features, please contact Reid Sczerba ([reid@jhu.edu](mailto:reid@jhu.edu)) to begin the process of linking your Blackboard course to Gradescope.