# Variate Roadmap

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In Research

New Randomizations
What we’re doing:
Allow students to get a new randomization of a problem.

Why we think you’ll like it:
Make it easy for students to have additional opportunities to practice concepts important to course outcomes.

Select multiple problems from a pool
What we’re doing:
Current problem pools will randomly select one problem for each student. We will change this to allow instructors to configure how many problems they want to pull from a pool.

Why we think you’ll like it:
Improves the assessment building experience.

Student Response Unit Validation
What we’re doing:
Allow students to specify units for numeric and expression responses in a separate input box.

Why we think you’ll like it:
Instructors can measure their students’ ability to use appropriate units.

In Development

Increase support for complex math
What we’re doing:
Configure the Variate math engine to support complex math (imaginary numbers).

Why we think you’ll like it:
Complex math will allow for more valid problem instances and a wider support of problem types.
Ordered Multiple Choices

What we’re doing:
Currently Variate automatically randomizes the order of multiple choice responses. We are going to give instructors the option to retain choices in order.

Why we think you’ll like it:
Optionally locking the choice order makes it possible to reference other choices, such as “All of the above”, or “Both A and B”.

Printing assessments with an answer key

What we’re doing:
Allowing instructors to print versions of a Variate Assessment with an answer key.

Why we think you’ll like it:
Printed assessments support accommodations with the Disability Resource Center. Other considerations include on-paper exams that are scantron-ready.

Enable alternate response formulas for numeric response problems

What we’re doing:
Allow instructors to configure alternate responses and/or tolerances with partial (or full) percent correct.

Why we think you’ll like it:
Students could automatically get credit for making minor mistakes that are common for the type of problem.

Enable alternate response feedback

What we’re doing:
Instructors will be allowed to enter feedback associated with alternate responses, and configure exams to optionally show students that feedback on their attempts.

Why we think you’ll like it:
Allowing instructors to give feedback associated with alternate responses enables students to learn from their mistakes.
Completed

Add support for rich text for input box unit and prefixes

*What we did:*
Gave instructors more styling options for the unit and prefix.

*Why we think you’ll like it:*
Currently only plain text is supported for input box labels. With this change, instructors will be able to use superscripts, subscripts, and Greek letters.

Assessment read-only preview

*What we did:*
Added an option for instructors to preview an assessment from the assessment edit page.

*Why we think you’ll like it:*
Sometimes instructors need to view an entire assessment while creating it so that they can identify overall misunderstandings that a student might have.

Respondus LockDown Browser integration

*What we did:*
Allowed instructors to require Variate assessments to be taken in a locked down browser environment.

*Why we think you’ll like it:*
Instructors may want to keep their students from accessing prohibited materials on the internet while taking a Variate assessment. Students could use their own computers and instructors could still be assured of the academic integrity of the assessment.

Conditional/Boolean logic in formulas

*What we did:*
Allowed formulas for variables and responses to change their output depending upon if a preset condition evaluates to true or false.

*Why we think you’ll like it:*
Allowing for conditional logic inside of variable and response formulas will allow for more flexibility in creating unique problem instances, as well as allow constraints to be added so that values better represent real-life scenarios or rule out impossible ranges.
New home page
What we did:
Changed the look of the Variate home page to show each current course and any open assessments.

Why we think you’ll like it:
Instructors and students can see at a glance what is going on in each of their courses.

Improve sort for list of assessments when publishing
What we did:
Make assessment list sorted/searchable when publishing.

Why we think you’ll like it:
Currently assessments are sorted by ID number which displays oldest to newest. With improved sort and search options, instructors will be able to find their assessments more easily.

New variable type: Variable tables
What we did:
Allow variable associations so that they can be used together in a problem statement, for example, the names of various chemicals and associated values for chemical properties.

Why we think you’ll like it:
Instructors will be able to create associations between text, images, and sets of values, so that they can use them together in one problem statement and don't have to create multiple problems and/or problem pools to assess a given learning objective.

Add image/text variable types
What we did:
Allow instructors to create a variable that is a list of words or images.

Why we think you’ll like it:
Varying text or reusing images in a problem part or multiple-choice option can allow more forms of randomization or save time creating problems.
Add support for styling tables in a problem statement

*What we did:*  
Allowing instructors to create a table with cells of text and/or variables in a problem statement.

*Why we think you’ll like it:*  
Currently, instructors must use an image if they want to include a table in problem statements. Adding the ability to create a table structure and add cell elements will allow instructors to create tables with higher fidelity and even allow them to place variables within cells.

Shared libraries

*What we did:*  
Allow instructors and course coordinators to create shared libraries so they can save time and effort while easily sharing problems.

*Why we think you’ll like it:*  
Large courses with professional instructional staff need a way to share problems and assessments with instructors or other staff that change from semester to semester. In addition, if an instructor has others creating problems/assessments for them, they need an easier way to share ownership. Shared libraries would make managing this ownership sharing much easier.

High-stakes assessment (exam) mode

*What we did:*  
Allow instructors to control student access to their work to better promote academic honesty on high-stakes assessments.

*Why we think you’ll like it:*  
In some circumstances, instructors may want to prevent their students from seeing their completed assessment until after the score release date. For example, when there are several sections of a course taking an exam at different times, the problems may need to be unknown to students who have not yet taken the assessment.

Improve student experience when an assessment is completed

*What we did:*  
Clearly inform students when they’ve done everything needed for an assessment and can safely exit Variate.

*Why we think you’ll like it:*  
Right now, when students have answered all problems in an assessment, there’s no obvious next step or sign that they’ve done everything they needed to do. We’re looking into how we can make this clearer for students, so they’re not left with a sense of uncertainty or unease that they forgot something.
Problem pools

What we did:
Allow instructors to create groupings of problems and have Variate randomly select one of the problems from the grouping to present to each student in their assessment.

Why we think you’ll like it:
Right now, all problems added to an assessment are displayed to students. This feature would allow instructors to create comparable questions of equal difficulty that vary in their descriptions and/or what the student would need to solve. These question pools (or groupings) could be added to an assessment and Variate would randomly choose a question from each pool to display to each student when they take their assessment.

Problem health

What we did:
This feature will provide more transparent statistics about the success rate of a master problem and frequency of errors that could limit the number of available working variable combinations.

Why we think you’ll like it:
Variate’s strategy to prevent broken problems made it difficult to identify if a master problem had common errors that were reducing the number of unique variable combinations or causing unnecessary load on the Variate servers. By being more transparent about how often a master problem succeeds and fails, you will be able to confidently create better problems with more working variations.

Schedule exceptions per student

What we did:
Allow instructors to give a specific student a schedule exception on a Variate assessment. This feature should not be confused with late penalties.

Why we think you’ll like it:
Currently, instructors can extend a due date on a Variate assessment for all students in a course, but not to individual students. Granting schedule exceptions per student can help you have flexibility when unexpected circumstances arise, and a student needs to start an assessment earlier or needs more time to complete an assessment.
Problem generation performance improvements

What we did:
Generate working problems for each student prior to their assessment start date.

Why we think you’ll like it:
Previously, problems (including their variable values), were not generated until a student opened their assessment. The extra loading time could cause students undue stress or mistrust in Variate, especially if students were taking an assessment synchronously. These improvements are designed to reduce loading time and identify any concerns before the assessment is opened to students.

Instructor view for student assessment scores and progress

What we did:
Created views within Variate to give the instructor a summary of the scores on an assessment and to drill down and view more details about the progress individual students are making on assessments.

Why we think you’ll like it:
Previously, scores and attempts for assessments could only be viewed by downloading a CSV file and parsing through it. A user-friendly and navigable view of each student’s progress and scores for an assessment provides a clearer picture of where the student excelled or got stuck.

LTI integration: Deep linking of Variate assessments

What we did:
Allow instructors to link to existing Variate assessments from their course in Brightspace.

Why we think you’ll like it:
Linking directly to a Variate assessment from Brightspace improves communication with students about which Variate assessment they need to be working on. Deep linking will also allow links to Variate to be added within a Brightspace quiz.

Learn more:
• Variate integration with Brightspace
**LTI integration: Authentication, roster sync, and grade push**

*What we did:*

Allow instructors to link to Variate from a course in Brightspace.

*Why we think you’ll like it:*

LTI integrations take a little effort to set up, but then create a seamless experience between Brightspace and Variate. LTI linked courses allow students and instructors to open a link to Variate without having to login a second time. Roster sync will automatically keep your class list in Variate up to date. Automatic or manual grade push will add assessment scores from Variate into your Brightspace grade book.

*Learn more:*

- [Variate integration with Brightspace](#)

**Multi-part and multi-statement problems**

*What we did:*

Add the ability to make problems more robust by supporting more than one statement text box. Each statement can then have multiple responses associated with it.

*Why we think you’ll like it:*

This gives instructors more creativity and flexibility. You can structure a problem to best fit your needs while using the same set of randomized variables.

**Number formatting options for variables and solutions**

*What we did:*

Allow the instructor to customize the way that calculated values appear to a student and is used in further calculations. This feature should not be confused with enforcing the student to input an answer in a specific format.

*Why we think you’ll like it:*

Previously any calculated variable or the correct answer to a formula response would show as having 15 decimal places by default. Adding number formatting types means the instructor can control the number of decimal places displayed and support the display calculated values in other formats, such as fractions or percentages.
**Multiple choice questions**

*What we did:*

An instructor can now choose multiple choice as a response type. The instructor can control how many choices they want to add to a problem.

*Why we think you’ll like it:*

Adding multiple choice allows you more flexibility. Each multiple-choice box has the same features as the statement box, so you can add pictures, variables, images, and more to your choices. The instructor controls the number of choices, and the choice order will be randomized for students.

**Timed assessments with accessibility accommodations**

*What we did:*

Assessments can now be published with a time limit. Instructors also have the option to grant individual students a timer multiplier to account for any accommodation that may be necessary.

*Why we think you’ll like it:*

Timed assessments can be enabled for higher stakes assessments to achieve your pedagogical goals for your class. The flexible timer accommodation is also set at the course level, so you do not have to add special access rules to every timed assessment.

**Allow instructors to edit problems in published assessments**

*What we’re doing:*

Problems in live assessments that students are actively taking (or will take soon, i.e., published) can have certain things edited: problem statements and solutions, attempt limits, points, and correcting multiple choice options, to name a few. Some items are still blocked: you can’t edit variables or add new problems to timed assessments.

*Why we think you’ll like it:*

Sometimes a simple mistake will be found after students have already started taking an assessment. Cancelling an assessment and making a new version can be frustrating for both instructors and students, so we’re trying to eliminate that need as much as possible by allowing certain edits to live assessments.

*Learn more:*

- [Editing Published Variate Assessments](#)