

# The Learning Science Behind Connect

## Using Metacognition to Improve Student Confidence and Success

Rather than use a one-size-fits-all approach to instructional design, the *SmartBook* adaptive technology within *Connect* creates a personalized experience tailor-made for each student.

*Do students really know what they think they know? Do they know what they don't know?* These are the questions answered through metacognition. In *SmartBook*, each student is asked to rate their level of confidence after answering each question. Over time, student self-assessment of their knowledge drives the adaptive learning experience, and *SmartBook* gets better and better at identifying that student's learning needs. *SmartBook* also continually adapts the content presented to students based on student responses in real-time, ensuring they are always engaged with the most impactful content.

*Features available within SmartBook provide a continually adapting, personalized experience for each student*

## Adaptive Learning Resources Make Study Time More Productive

Students complete assigned preparatory “Reading” and “Practice” in *SmartBook*. Key passages are highlighted for immediate reading, according to the instructor's learning objectives. The highlighting experienced during the Reading phase and probes presented during the Practice phase continuously adapt to each learner based on their activity.

## Each Student Receives a Unique Learning Path

Each “probe” (a data-informed question) corresponds to a learning objective covered in the assigned content. Each learning objective has multiple probes spanning varying levels of difficulty. Before responding to the probes, students first report on their confidence level of whether they know the answer. Behind the scenes, the seemingly simple probes capture a myriad of data, including baseline knowledge, confidence, and user behavior such as time to select answer, time on feedback and more. This not only assesses the user's knowledge level, but also informs the next probe and the student's unique learning path.

## “Recharge” Reinforces The Right Material At the Right Time

Using the data gleaned from probes, in-platform content review, and metacognitive intelligence, *SmartBook* uses complex algorithms to predict the moment a learner is about to forget something. The Recharge feature then provides a resource for students to review and reinforce topics when needed. The rate of memory loss and topics covered are unique to each student, therefore the recharge experience is entirely unique to each learner as well. The result is long-term knowledge retention that leads to mastery – and ultimately better outcomes.

### *Overcoming Memory Decay to Improve Course Outcomes*

In 1885, scientist Hermann Ebbinghaus extrapolated a startling new hypothesis: Humans tend to remember only half of newly-learned knowledge in the following days or weeks unless that material is reviewed. This is known as the Ebbinghaus Forgetting Curve, and it represents one of the key underpinnings of how *SmartBook* works to improve knowledge retention and long-term concept mastery.

*“I have never enjoyed reading a textbook or been able to retain much information with it, but with the online interactive features of Connect, it makes learning fun, interesting and allows me to actually learn and retain information.”*

*– Melissa, student at University of Maine at Machias*

*“Overall, Connect has allowed me to fine-tune my lecture. I am able to go into detail quicker in the lecture period since the students have completed their SmartBook modules and have an understanding of chapter topics... Students tend to generate more detailed questions now, specific to the topics discussed.”*

*– Dr. Vanessa Hörmann, professor of Biology, Broward College*

## Using Data to Improve Student Performance

One way to impact student performance is to provide the instructor with real-time data from students, allowing them to intervene with students when needed and adapt their course to the individual student and class. *What topics have students mastered? Where are they struggling? Are they engaged? Who is at risk of dropping out?* Connect’s powerful, data-driven reporting gives clear answers to these questions, allowing instructors to make intelligently designed learning experiences.

*Features available within Connect make it possible for instructors to approach a class of 50 like a class of one*

### Get Key Insights At-a-Glance with Connect Insight™

A visual analytics dashboard – now available to both instructors and students – provides at-a-glance information regarding student performance that is immediately actionable. By presenting assignment, assessment, and topical performance results together with a time on task metric that is easily visible for aggregate or individual results, *Connect Insight* gives the user the ability to take a just-in-time approach to teaching and learning.

### Gain More Comprehensive Insights with Powerful Connect Assignment Reports

*Connect* can generate a number of powerful reports and charts across a diverse set of variables to give instructors the information they need to easily evaluate performance across the course, each class or by individual student to keep students on a path to success. The “At-Risk Report” highlights each student’s engagement in the course material to allow instructors to quickly identify students who might be vulnerable to dropping out of a class or struggling to pass.

### Know What Students Know and Don’t Know

What are the most challenging learning objectives? What probes and assignment questions are students getting right and wrong? Through the reports generated by *SmartBook*, instructors can see where students are struggling and can tailor lectures, assignments and study materials to suit.

*“The ability to tailor a student’s learning experience toward the things the student doesn’t know rather than what the student has already grasped is incredible, especially when there are huge numbers of students involved. This experience allows the course to be individualized for each student rather than offering a one-size-fits-all, ‘canned’ course experience.”*

*– Professor Tiffany Guidry,  
University of Alabama-Tuscaloosa*