
Learning Gets Personal:

A Guide to Adaptive Learning and Personalized Education





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Introduction: What is Adaptive Education and Learning?

At its most basic level, adaptive education is a more personalized approach to learning – moving beyond the one-size-fits-all educational model that is largely ineffective. With it come a set of educational tools which promise to make a significant contribution in measuring student learning and aptitude, improving retention, boosting program outcomes, and enhancing overall instruction.

This guide is designed to help you understand adaptive education and learn how to implement it into your program.

Part One introduces you to the educational theories behind adaptive learning. This helps you recognize and understand the extent of its capabilities. Then in Part Two, we'll discuss how you can begin to implement this technology into your program with a few examples using our adaptive products.

Adaptive learning represents an opportunity to use new instructional tools and new data in bringing the power of learning to more learners more effectively and more efficiently than ever before¹.

Using Adaptive Tools to Personalize Education

Adaptive tools work to make adjustments based on each student's interactions with the material. Over time, adaptive systems begin to anticipate the learner's strengths and weaknesses, and then deliver content based on that knowledge profile. With this type of instruction, students can take advantage of a non-linear, personalized approach to learning¹.

This gives every student the opportunity to receive daily feedback, and gives educators more time to help struggling students.

While every program has its own unique needs, this guide will help you implement adaptive technology and ensure it's being used to its fullest potential.



Part One:

The Building Blocks of Personalized Learning

01

Motivation through Gamification

To build clinical reasoning, students need to develop habits of processing that originate with deeper learning. They need motivation to pursue new discoveries while reinforcing what they've already learned.

Gamification allows students to create their own lesson plan based on personal strengths, weaknesses, and interests. When a course uses gamification tools (e.g., individualized learning modules, adaptive quizzing, achievement levels, and badges) students are motivated to push themselves and others to do better.

Individualized Learning, Assessment, and Quizzing

When using gamification, the instructor gives students personalized activities to complete in a time frame that best fits their own personal needs. This means that the learning activities, assessments, and quizzes are based on each student's prior activities and achievement levels. For instance, if a student indicates confusion with a particular

concept, that concept will be repeated more often for them.

Frequent individualized quizzing is also a significant motivational strategy and learning tool for students. These tools provide each student with a customized quiz based on their progression through the course, their previous learning activities, and other benchmarks set by the instructor.

► Gamification Tips:

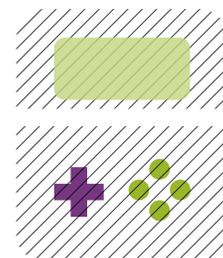
1. Provide an incentive for students, particularly through graded assignments, to ensure that they take advantage of the assessment components.
2. While some due dates are necessary, giving students a choice, when possible, can serve as an effective motivational tool.

Gamification Tools

Achievement Levels

When gamification is used, students can progress through various levels by completing certain activities and meeting goals.

Example: If students complete a module on loop diuretics, they receive 200 experience points. If they complete three modules in a week, they get another 50 points. Another example might include earning points through tiers of adaptive quizzing based on past performance (e.g. Tier One = 25 points, Tier Two = 100 points, Tier Three = 200 points, etc.). Once students get to, say, 1,000 points, they move from a rank of “private” to “corporal.” When they reach the rank of “general,” they are finished with the course.



Badges

Another motivational tool in the gamification instructional design is the badge. A badge indicates an accomplishment related to a certain domain.

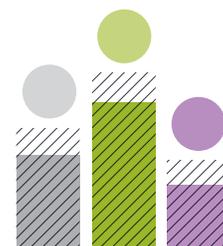
Example: When students have finished all four modules on diuretics, they get a badge with a urinal on it (to be worn proudly of course).



Social Engagement and Competition

From the beginning of time, people have been interested in the success of others compared to themselves. Competition serves to inspire people to do better. Gamification utilizes this interest to motivate students to pursue learning.

Example: The instructor may allow students to see their level, rank, or achievement within the class or compared to a national sample (if the tool is widely used). This sense of rank provides students with yet another reason to continue in their quest for additional growth.



02

Promoting Active Learning



Research supports the flipped classroom model as a best practice in nursing education²; using digital products is supported in the flipped classroom model, however, a key point is that technology alone does not drive better outcomes³.

For example, Elsevier Adaptive Quizzing personalizes content to each student's competence, allowing them to progress at their own pace through high-quality questions. Essentially, it helps you the instructor to gauge the pulse of the class or individual students to make meaningful interventions.

Tips for Using Adaptive Quizzing

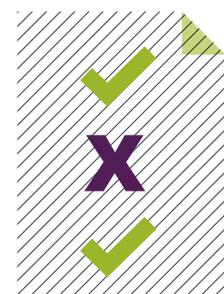
- 1. Emphasize the Benefits of Adaptive Quizzing:** Teach students how adaptive quizzing works and clearly outline the expected student learning outcomes. Student buy-in is key!
- 2. Make Adaptive Quizzing Part of the Weekly Routine:** Frequent use of adaptive quizzing is key to enhancing student learning and optimizes success. This quizzing can be student and instructor driven, our expert educators recommend that students spend two and a half to three hours per week using adaptive quizzing (including student- and instructor-made quizzes).
- 3. Reflection and Learning through Rationales:** Students report that a key benefit to adaptive quizzing is the immediate feedback they receive including rationales for correct and incorrect answers. Have students keep an adaptive quizzing journal and write down what they learned from the rationales in their own words.
- 4. Remediation with Adaptive Quizzing:** Have students create quizzes in content areas they struggle with. Content areas can be self-identified by the student or more formally identified through course exams and standardized testing.
- 5. Prioritize Mastery Quizzing:** Be mindful that students can take hundreds of questions, depending on the topic, to achieve a desired level of mastery. Therefore, you may want to prioritize five key course topics which reflect your course objectives. As a best practice, select one topic per assignment to ensure students have the most direct path to achieving mastery.
- 6. Weekly Custom Quizzing:** Custom quizzing allows you to choose a finite number of questions for a quiz. Assign one custom quiz every week to help your students prepare for class.
- 7. In-class Quizzing:** Create an in-class quiz and have students get in groups of two to take the quiz together. This will allow them to learn from each other by discussing answer choices and rationales.
- 8. Hold Students Accountable:** Assign points or a grade percentage for adaptive quizzing assignments.

Help Students Know What They Don't Know

When a student is struggling, it's important for faculty to help them prioritize their studies based on areas where they are the weakest. Adaptive technology can help quickly identify these areas so faculty can help the student who is struggling.

Identifying Weaknesses

Students should find ways of focusing on their weaknesses when they study. One way is to find questions for self-assessment in the adaptive quizzing tools they use. These quizzes are a great way to identify personal areas for growth as the quizzing tool is constantly adapting to the competency of the student.



Addressing Learning Gaps

After the student has taken a quiz, encourage them to focus on the questions they got wrong, this helps them to prioritize their study time. When they don't focus, many students will lean towards studying things they enjoy or with which they are comfortable first and not on the areas they need help.



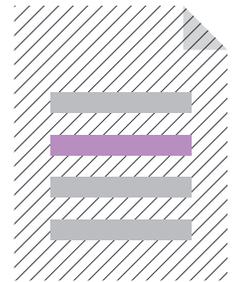
03

Prioritizing Weaknesses

Three Ways to help Students Address Learning Gaps

Highlight:

Many students never learned the best way to highlight important information in their textbook. Teach them to highlight one-two sentences based on the question they got wrong.



Watch:

Another strategy is to watch a couple of instructor-recommended short videos (less than 10 minutes) online related to the question they got wrong. Then after they watch it, write down two things that were good about the video as key takeaways to remember.



Set Goal:

Lastly, teach students to set a personal goal for each practice quiz question they answer incorrectly. For example, have them create three note cards for each incorrect question. Encourage them to keep it simple and not fall into the trap of writing a paragraph on each side of the note card.



- ▶ **Best Practice:** Faculty must provide a structured remediation plan to help students effectively use information about their weaknesses to improve performance.

Taking Vitals Daily

Continuous assessment is equivalent to taking vitals often. A nurse would not let a patient go for long periods of time without knowing their status (e.g., vital signs). In education, a similar requirement is present. Instructors need to frequently “take vitals” — Where is the student today? What does she understand? Where is the cohort today? What do they understand?

Continuous Assessment

Continuous testing brings efficacy and efficiency to the teaching and learning process.

Continuous assessment can come in many different forms, using multiple tools. For instance, in Elsevier’s Sherpath, students interact with didactic lesson content with interspersed micro-quizzing. If a student misses a micro-quiz question, it will take a student back to where that content was derived from in the lesson for instantaneous reinforcement, then students can repeat the micro-quiz question(s).

Sherpath lessons also have post-lesson assessment that is a powerful feedback tool for both instructors and students. Instead of waiting for the student to read for hours, just hoping he/she retains/understands, the post-lesson assessment will provide students with feedback on their learning and instructors can identify areas for meaningful, perpetual intervention based on performance.



04

Cohort Assessment



Elsevier Adaptive Quizzing

Elsevier Adaptive Quizzing (EAQ) provides students and instructors with a set of vital signs as they take quizzes throughout the course. EAQ quizzes can be leveraged in a variety of ways to address student performance needs, reinforce course learning objectives, and prep/remediate for exams. When students use EAQ, they are provided with instant feedback on their quiz performance and rationales associated to all questions to help them learn and contextualize the content.



Additional Quizzing

Other types of continuous assessment include the pre-class or beginning-of-class quiz. We know that if a student has a quiz to complete before class, or suspects a pop quiz at the beginning of class, he/she is more likely to read. This motivational strategy also will help the learner identify personal gaps in understanding and allow him/her to spend more time focused on personal weaknesses.

Pre-class quizzes can also help educators determine what to focus on during class time. For instance, if a quiz is given online, the instructor will get an instant performance report. They can then quickly look at the results, identify three or four questions where scores were the lowest, and make them the focus of the lecture.



Using the Data

On a larger scale, students should be continuously assessed with standardized testing tools across the curriculum. **Students should receive at least one or two standardized exams as graded activities per semester.** The reason for this is to identify knowledge gaps in individuals and cohorts long before graduation. For instance, in semester one, the students take the pharmacology and health assessment HESI exams for a grade (maybe as a final exam in the course).

The personal student reports from these assessments become learning objects in semester two (e.g., students journal in clinical based on the part of the HESI exam where they scored the lowest). The cohort reports help instructors in semester two develop adaptive learning activities that can address some of the overall needs for the class (e.g., the cohort report shows that this group of students is especially weak in the evaluation part of the nursing process).



Part Two: Implementation

It's Time to Adapt

How to further student engagement by implementing adaptive technology.

Adaptive technology allows educators to use instructional tools and data to help students learn more effectively and efficiently than ever before. However, some educators may find the sheer number of resources overwhelming and could potentially overuse or underuse the products available to them.

Now that you know the theories, the second part of this guide is designed to help you begin implementing adaptive products into your program to enhance your students' ability to learn.

Steps to Consider

There are three important steps to successfully plan implementation of digital products in your course. First, it is important to review your course outcomes and objectives. Next, learn all you can about the product(s) you are considering. Once you've selected your product, be sure to complete the training to ensure you have a clear understanding of how to use it.

Before you begin, ask yourself the following questions:

- How is your content currently presented and is there a better way to present it?
- Is there something you expect from the student that the adaptive product will promote?
- What is your goal for adding an adaptive product to your course?

► **Best Practice:** A good way to introduce adaptive products is to integrate them into your syllabus, so students know what to expect and understand course requirements.

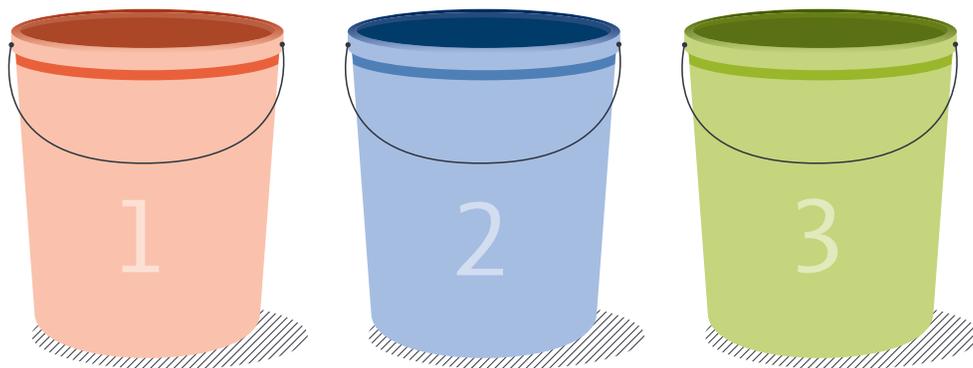


The Bucket Strategy

As discussed earlier, technology alone does not help drive better classroom outcomes. Sure, adaptive products are supported by the flipped classroom model, but educators need a way to determine how to place them in their course. To help effectively use digital products, including adaptive technology, in the classroom, nurse educator Megan Ubben has developed **The Bucket Strategy**. The Bucket Strategy uses steps from the cognitive learning organization style known as Bloom's taxonomy as its structural framework (see illustration below).

There are three main buckets to help you utilize digital products. Bucket one is student preparation for class, bucket two is in class time, and bucket three is evaluation. **This outline is here to help you place products in the correct bucket.**

Bucket one – student preparation – aligns with the *Remembering and Understanding* level of Bloom's taxonomy. **Bucket two** represents time spent in class and aligns with *Application* and higher levels of Bloom's. **Bucket three** represents evaluation either as student self-evaluation or formative evaluation by the nurse educator and is aligned with *Analyzing* and higher levels of Bloom's.



Student Preparation, Bloom's Levels: Remembering and Understanding

In-Class Time, Bloom's Levels: Application, Analyzing, Evaluating, and Creating

Evaluation, Bloom's Levels: Analyzing, Evaluating, and Creating



Consider the Content to Fill Your Buckets

The last step is to think about the content you are covering and **how the adaptive products might help to improve your teaching strategy**. Consider the following questions for each digital product:

- **Bucket 1** - Do you want to drive better preparedness ahead of class?
- **Bucket 2** - How will you create an active and engaged learning environment?
- **Bucket 3** - How will you promote student self-evaluation and formative evaluation as the nurse educator?

Answer the questions above for **each content area** of your course.

After you've answered the questions above, it's time to determine what products you want to use in each bucket in order to meet your course objectives. It is important to note that **products can be used in multiple buckets depending on how you implement them**.

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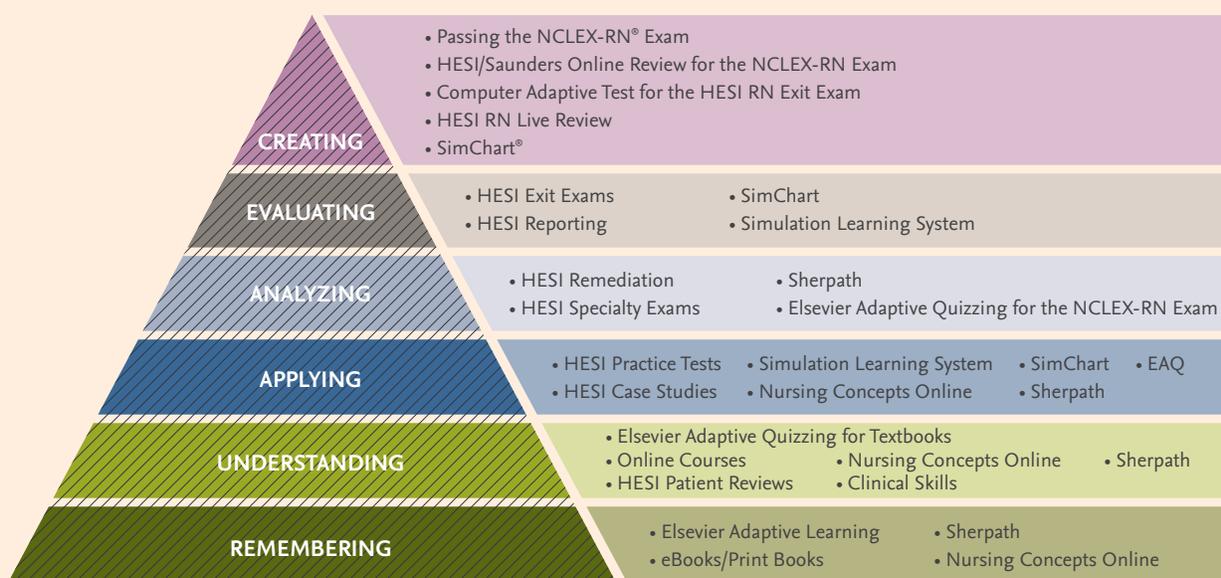
Choosing Adaptive Products

An Example of Where Elsevier Adaptive Quizzing (EAQ) Might Fit in the Bucket Strategy

Elsevier Adaptive Quizzing is an excellent learning tool that can help students progress from lower to higher levels of Bloom’s taxonomy. To help students align with **bucket one**, faculty can assign a 30-question “custom quiz” prior to class. When answering questions, students receive rationales with page numbers in their textbook (if using book-specific version of EAQ) to refer to material they’re struggling with. Afterwards, have students write out a few sentences related to the content that they read in the book for all incorrect questions from the 30-question pre-class quiz. This is a meaningful and purposeful activity to help drive students to content and get them to understand the lower levels of Bloom’s taxonomy prior to coming to class.

In-class time should be spent at the application level or higher (**bucket two**). To help students apply content using Adaptive Quizzing you can create a “Custom quiz by Question” assignment where you select individual, relevant questions and have students work in pairs to answer the questions as an in-class activity. Peer-to-peer discussion regarding answer choices and rationales promotes higher level thinking in the classroom.

Elsevier Adaptive Quizzing can also be used as a formative assessment tool (**bucket three**) to help faculty evaluate and monitor student performance. For instance, faculty can assign “Mastery level quizzes” prior to unit exams. If students are not able to meet the assigned Mastery level, further studying and preparation should be done prior to the exam. Adaptive Quizzing helps faculty identify “at risk” students early instead of waiting until after the unit exam to realize the student needs additional help.



Bloom’s Taxonomy: Determine which product(s) you want to use in each bucket – keeping in mind your course objectives. And remember, products can be used in multiple buckets.



Measuring Success

Traditionally, student performance is measured with summative assessments such as grades on course exams. Adaptive products are valuable, formative assessment tools that give students and nurse educators immediate and early feedback. Nurse educators can set expected benchmarks for students in adaptive quizzing. Failure to achieve benchmarks can be an indicator that the student is at risk and further intervention is needed.

For example, the educator can assign students a Level Two Mastery quiz prior to the course exam related to that content. If a student is unable to achieve the Level Two expectation in the assigned content area, this indicates that further preparation may be needed prior to the student taking the exam to increase the likelihood of success.

Conclusion

Planning a course with adaptive products is a great way to level the playing field for students with different learning styles and abilities. With solutions designed to measure student learning and aptitude, improve retention of the material, boost program outcomes, and enhance overall instruction — Elsevier is committed to delivering actionable strategies and ideas to help you implement the right adaptive tools into your program. If you're feeling stuck, refer to any part of this guide, or visit myevolve.us/resources for additional peer-to-peer advice from expert educators.

Ready to adapt? Visit myevolve.us/adaptive for an in-depth look at all of our adaptive products and solutions.



References

¹ Education Growth Advisors. “Learning to Adapt: A Case for Accelerating Adaptive Learning in Higher Education.” Education Growth Advisors, Mar. 2013. PDF File. 25 Aug. 2014.

² Breda, K., & Towle, A. (2014). *Teaching the Millennial Nursing Student: Using a “Flipping the Classroom” Model*. *Nursing and Health* 2(6): 107-114. doi: 10.13189/nh.2014.020601

³ Kolb, L. (May 12, 2017). *Students’ Best Tech Resource: The Teacher*. Edutopia. Retrieved from <https://www.edutopia.org/blog/students-best-tech-resource-teacher-liz-kolb>



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