

# The coming adaptive world

This is the year of adaptive learning. Everyone is fired up about it, from Arne Duncan and Bill Gates to individual teachers and students the world over. Ironically, as the idea of adaptive learning is becoming more popularized, confusion about it is increasing exponentially. So please bear with a little introspection, but I think now is the time to clarify matters. Let me start with an analogy...

In 2006, my old Harvard Business School classmate Andy Jassy realized that all computing would ultimately move to the cloud. A senior manager at Amazon, he got approval from Jeff Bezos to launch Amazon Web Services, which is today the leader in cloud computing infrastructure. Startups, and even many big companies like Netflix, outsource their hosting infrastructure to AWS.

Knewton's goal is to be like AWS for education. We've created a shared data infrastructure platform that makes it fast and easy for anyone to build extremely powerful adaptive learning applications with Knewton. As our platform gets stronger over time, with more features and more data, every product built using our platform automatically gets stronger too.

Despite our constant protestations to the contrary, [observers](#) often confuse Knewton with the many adaptive learning app makers who are now popping up. Or they confuse app makers with platforms. Or they think we're all competitors.

In fact, it is Knewton's mission to *help* all these adaptive learning app makers.

Due probably to Google and Facebook, it's become fashionable in tech circles to describe oneself as a platform despite the word's actual meaning. To be a platform simply means that one's technology is not an end-to-end solution but instead powers other applications and businesses. There's nothing innately glamorous about platforms. Most platforms are largely anonymous and pretty boring.

There will soon be lots of wonderful adaptive learning apps: adaptive quizzing apps, flashcard apps, textbook apps, simulation apps — if you can imagine it, someone will make it. In a few years, *every* education app will be adaptive. Everyone will be an adaptive learning app maker.

Knewton doesn't create these apps — we work with partners to help them create their own. We create no content, nor do we claim unique expertise in instructional design, cognitive science, or pedagogical approach. But we do help make everything from your content to your pedagogy better, by optimizing them with deep student proficiency data.

Knewton isn't even, ultimately, an adaptive learning platform. Adaptive learning is merely one (completely awesome) feature that can be done with our platform. Knewton is an infrastructure platform that consolidates data science, statistics, psychometrics, content graphing, and tagging in one place, and allows for the consolidation and pooling of student proficiency data.

This infrastructure unlocks for the first time the vast quantities of data that students have always produced — data that make adaptive apps exponentially more powerful. The infrastructure is also extremely complex and expensive. Sure — it's straightforward enough to wire up a simple, self-contained adaptive app, based on a pre-determined, limited

decision-tree. But how much better would that app be if it contained an effectively unlimited amount of back-end content? If all of its assessment items had been algorithmically “normed” so that they resulted in exact concept proficiency data for each student? Or if the app pre-acted to the learning modalities of each student? Or if it “started hot” so that from Day 1 of a student taking a new course, all her prior concept proficiencies and learning styles had been preloaded?

Knewton makes possible all these things and more. Today, Knewton functionality includes pinpoint student proficiency measurement, content efficacy measurement (yes, we can tell you how effective your content is), student engagement optimization, atomic-concept adaptive learning, and concept-level analytics. Next year we’re adding “adaptive tutoring,” which combines the wisdom of crowds with Knewton’s network to find the perfect people online right now to give you real-time help.

We also provide scalability, distribution (if you have a great app, we’ll promote it to our partners), and network effects (the combined power of all the data helps each student learn each concept). And we do it without storing any personally identifiable information (“PII”) unless a student wants us to have it.

All of this stuff is so costly and complicated that no one has ever, or would ever, try to build it all just to power one app. It would be like automobile manufacturers feeling like they also had to build and maintain all the nation’s highways. Knewton can accomplish it only by amortizing, over every app we support, the extraordinary burden of creating these features.

Besides, student proficiency data are much stronger together than apart.

A closed, isolated app can by definition never have more than a fraction of the proficiency data that Knewton's open platform has. Even that assumes that the app contains "normed" assessment items (which Knewton does for free); otherwise it generates no proficiency data at all.

To make all this stuff work requires hundreds of millions in financial capital and an unreal degree of human capital. Knewton is lucky enough to attract top data scientists, psychometricians, and software engineers from around the world — people who choose Knewton over offers from incredible companies like Google, Palantir, and top Wall Street firms.

It's been a struggle for us to get where we are today. Until recently, only large learning companies and university systems could use the Knewton platform. But now our enterprise API is flexible enough for a much wider audience. We're happy to partner with anybody — even so-called "competitors." We can't quite say "yes" to everyone who wants to work with us yet, but our capacity is growing by leaps and bounds every day. We just [issued our 200 millionth recommendation](#) (suggesting the optimal next bit of real time content for a student) and will be into the billions by the end of the year.

Ultimately, all learning materials will be digital and they will all be adaptive. Big companies, start-ups, schools, and individual teachers will make them. We hope to enable them, and can't wait to see the amazing things people create. AWS made life a lot easier for everyone else on the Internet. If Knewton can accomplish something similar for education, we'll feel like we did a pretty useful thing.