

WHAT TO GLEAN FROM DATA STREAMS

Leverage course analytics to inform
instructional design decision making.

BY ADAM HOCKMAN



Build, launch, repeat. That is the mantra most overstretched learning design teams follow when they move from one project to another. The details and demands are nonstop, and it's hard to see the big-picture forest through all those trees. The volume of training requests or the time spent managing stakeholder relationships can easily distract a team from the learning data and analytics at their fingertips.

Most instructional design frameworks include an element of evaluation—be it formative or summative, during rapid prototyping or after a release—but evaluation often gets sidelined when disjointed technologies and learning management systems make data capture, synthesis, and analysis difficult to achieve.

Stakeholders further complicate the process when they ask for key performance indicators not directly linked to the training itself. The people operations team may want the employee engagement KPIs they think your training solution will affect, but the organization does not have performance-monitoring systems with which to observe employee behavior or work outputs that result from training. There may only be indirect, secondary engagement measures, such as survey results, which could be more indicative of the work environment (employee relationship with their supervisor; quality and frequency of performance feedback) than the training solution.

Given all that, how do you build a learning infrastructure that makes good use of all that learning analytics have to offer? Is it possible to meet KPI requests, measure critical work outputs, and still evaluate training effectiveness?

How we measure learning

To max out learning analytics, identify which data is important and useful. Most training programs generate percentages for participant performance: the percentage correct on knowledge checks or training activities, pre- and post-test scores, or the percentage of training steps completed. Many provide a temporal component: time for completing a course, to achieve proficiency, or until working independently on the job. When those are the only measures, it's hard to drive actionable steps to improve and maintain training programs.

Let's say there is a 20-minute e-learning course with five knowledge checks. The course likely generates

percentages for the correct answers to those questions, the time it took to complete the course, and satisfaction survey results. Those data points do not show that performance changed (or didn't) due to the training solution. Perhaps a course participant went back to their work environment and performed a technical skill they learned in the course but their success was influenced by the software's intuitive design and prompts or by help from a co-worker. Maybe that participant didn't need training to begin with or their improved performance wasn't the result of the course. In short, the learning measures collected are of limited value.

An alternative to percentages regarding completion and readiness times is understanding how well and how quickly someone performs job tasks, whether they are discrete skills or high-level decision making. For instance, a medical professional training for a new procedure needs to do it at a specific level of accuracy and at a certain pace—what some call *behavioral fluency*. That professional can't spend an hour on a procedure to be 100 percent correct if they must perform it in three minutes in the real world.

Instructional designers need to account for that difference through their learning data and analytics. You need that information—how well, how quickly—to structure a course with useful learning activities as well as to design ways to measure and analyze the data that comes from them. The closer you get to measuring accuracy and pace of performance, the closer you get to linking training to meaningful work outputs and KPIs.

Build more robust learning analytics

Regardless of training format—e-learning, on-the-job practice activities, simulations, or job aids—it's necessary to capture behavioral and work output data. As a first step, look at your learning systems, processes, and technologies to see how they answer the following critical questions.

What content and skills are you teaching and how? Different learning requires different instruction and practice. In a driver's safety training course, for example, participants would:

- Identify road signs or conditions.
- Apply rules on how to respond to those signs and conditions.
- Execute motor movements related to driving in those conditions.

Those three related objectives require separate learning design treatments.

For the first objective, there could be a timed task where participants see a sign and type the name for

the sign as it appears on the screen. That is an easy way to measure accuracy and pace of responding. It's also a task that offers more opportunities for practice than a simulation.

Regarding the second objective, a virtual simulation where learners apply rules taught in a lesson may do the trick—participants work through a simulation sequence and make decisions. Each question and answer leads to a new, unpredictable opportunity for applying various rules. Again, you can measure accuracy (how many correct decisions they make) and pace (how quickly they make correct decisions). In the real world, a driver's response rate to a safety issue is critical because their life and others' lives are at risk.

Finally, for the third objective, you could use a video game (or car simulation). Here, participants control the vehicle's speed, gears, and pedals. The simulation's realistic practice opportunities would yield measures of a driver's accuracy and speed of responding to changing road conditions.

REGARDLESS OF TRAINING FORMAT, IT'S NECESSARY TO CAPTURE BEHAVIORAL AND WORK OUTPUT DATA.

Those interlocking objectives warrant distinct activities to measure performance. If you were to cram them together in the same learning package with a single completion or accuracy score, you would not have sufficient data to map course performance onto real-world driving behavior and relevant KPIs.

What delivery format should you use to gain the best insights into learning? For the driver's safety training course, there are many ways to design it. In-person workshops or digital simulations can yield performance data that gives close-in views of how well and how quickly a participant engages in performances related to the learning objectives. Which design path to take depends on your capabilities and capacity. There is a low-tech option, such as role play, and a higher-tech one, such as a branched computer-based simulation.

For either path, think through the data streams that each activity and delivery format produces.

In one client project I ran, my team wanted to know how participants performed in a simulation,

but the LMS and authoring tools didn't provide the fine-grain details we needed to make decisions about training effectiveness. We had to rebuild the entire course with multiple authoring tools and then piece them together in the LMS to look cohesive to the user. With that approach, we were able to obtain accuracy and pace data for each task and link them to specific kinds of learning (concept, motor skill, and strategy). We didn't let LMS and authoring tool limitations stifle our goal of capturing and analyzing learning data. My point here is that there are usually creative ways to get around such barriers.

Do you capture data across the vertical? Think of every training solution as a vertical ladder with rungs that represent snapshots of learning across time—from pretest to training activities to post-test to on-the-job performance soon after and months later. The immediately before and after training data is important, but whether those results stick around long after training ends should be of greater concern.

If a data point is missing from the ladder, add it. For example, is it possible to embed post-training booster sessions at monthly increments to capture data on how learners retain performance or apply the learning to novel scenarios? Such booster sessions will put you in direct contact with the learning solutions you have designed. If something goes well with participants, it could reinforce your design practices; flat performance may get you out of a development rut and force you to think about what you can do differently.

It's easy to start the process of capturing data across the vertical, of building your ladder. Find a few training participants, and study them over time. After they complete your course, go into their work environments and periodically check on their performance. Talk to them, directly observe them as they perform the skills from the course, and interview their managers. And then link those performances to broader work outputs or business outcomes.

When selecting performers to observe, choose individuals with a range of abilities, including those who performed poorly on the pretest (and even throughout the course) and those who demonstrated exemplary accuracy and pace in the program from start to finish. Observation across a spectrum of performance will help you adapt your designs to meet a greater number of participant differences.

When and how will you review the learning data? Once you have your data streams mapped across the vertical of the training program, you will have plenty of data to review. It's now a matter of when and how to review it. In an ideal world, you would have someone or a team dedicated to research and development on company training programs. They would regularly dive into performance data to analyze it and come up with improvement or R&D opportunities.

If that's not your reality, make a plan for specific intervals when you will review analytics. It should be a realistic schedule that is still useful to decision making. To jump-start the process, arrange a beta test with a few participants, and study their learning journeys. Watch them complete an asynchronous course live, ask them questions about the user experience, and push their knowledge and skills by trying out practice scenarios. Record their clicked, typed, motor, and spoken responses during training, and use those data points to revise the program before it ever goes live. As you do that, constantly return to your learning objectives, and check that you have found data snapshots across the vertical of learning.

Depending on the project's scope and the number and types of learning activities, you may also invest in a learning record store to merge data streams into a centralized location. That kind of system will enable simplified data reporting and analysis and keep all the data in your vertical in one place where

How to Maximize Learning Data and Analytics



1. Analyze critical content and skills.



2. Identify meaningful measures of learning and on-the-job behavior (think: accuracy and pace).



3. Choose training delivery formats that capture your selected measures.



4. Collect learning data throughout training and on the job.



5. Link learning data to work outputs and company metrics (think: Experience API).

you can easily view it as learners go back to their work environments.

Most learning record store platforms offer flashy dashboards with multiple visualizations of participant performance. That's nice, sure, but remember to stick to understanding the accuracy and pace of performance during training activities. Those analytics are a far stronger predictor of future performance than many of the data such platforms can supply.

Analytics-informed decisions

Small changes to how you design learning activities, capture performance data about those events, and visualize the data will bolster your decision making about your learning designs over time. When training activities become strongly correlated to improved on-the-job performance, celebrate. Dig into that data, and figure out how to replicate that success in your other offerings.

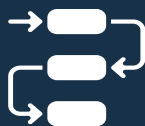
When you find that your training solution has not positively influenced on-the-job performance, make adjustments to it by relying on accuracy and pace of responding throughout training and afterward. In addition, review work outputs linked to business results. A close review of the performance along the entire vertical will give you ideas to try in the next iteration of your solution.

Keep searching for and uncovering different dimensions of human performance during and after training. Each participant brings their history and motivations to a learning event. Capturing individual differences through learning data and using that data to inform your designs builds a sturdy learning system that employees and companies can count on.

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6. Synthesize and analyze data to form a learning picture.



7. Prioritize training improvement opportunities informed by data and outcomes.



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