

Learning Effectiveness Measurement (LEM)

A White Paper by

Dr. Dean Spitzer

The Challenge of Learning Measurement

In addition, learning measurement is typically viewed as something that happens retrospectively (after-the-fact). Retrospective measurement does nothing to help trainers drive results. Measurement should be a critical component of planning for any training intervention, rather than an afterthought or a post-mortem. Furthermore, its primary use for accountability has led to driving measurement to its lowest levels (attendance and reaction). [For more detail on this subject, see my article “Embracing Evaluation,” *Training Magazine*, June 1999.]

Introducing Learning Effectiveness Measurement

Learning Effectiveness Measurement (LEM) was designed to address the weaknesses in the current approach. LEM is a methodology that provides a highly credible framework for measuring the value of training, both quantitatively and qualitatively, and guiding sound investment decisions. LEM also helps plan, deliver, and enhance training that will provide verifiable business value for your organization.

In contrast to traditional learning measurement, LEM was developed to guide the design of more effective (and powerful) interventions, as well as track its effectiveness. The rationale for LEM is the well-established principle: “What you measure is what you get!” Whatever we measure will inevitably drive the kind of intervention we design. That is why LEM was developed to better align learning with business results *upfront*, not just to measure learning effectiveness *after the fact*.

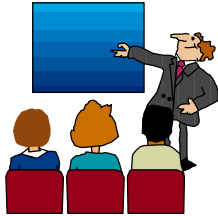
LEM measures learning effectiveness at all levels, but is primarily focused on Level 4 (Business Results or Business Impact), because that is the level that should drive everything else. [Incidentally, for government agencies, Level 4 can also be referred to as Organizational Results or Organizational Impact.] All learning measurement should be developed top-down (starting with desired business or organizational results). Other levels of measurement (attendance, reaction, learning, and on-the-job application) are important, but are really substitute or enabling measures.

What is Learning Effectiveness?

Effective means “producing the desired result.” So what is the desired result of learning? Here are some of the indicators that we tend to use as claims of learning effectiveness:

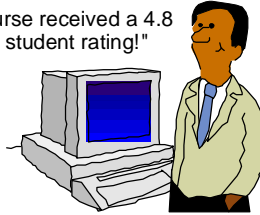
Attendance (Level 0)

"20,000 people have taken my course."



Reaction (Level 1)

"My course received a 4.8 out of 5 student rating!"



Learning (Level 2)

"95% of my students passed the end-of-course mastery test."



Application (Level 3)

"80% of my students are using what they learned on the job."



Business Results (Level 4)

"My course contributed to a \$650,000 increase in revenue."



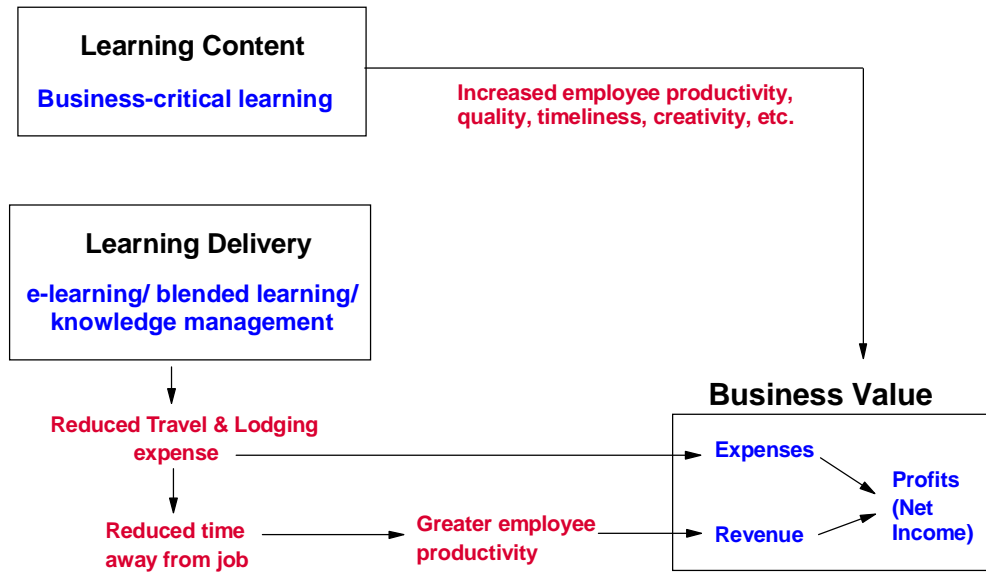
As positive as the other “boasts” of learning effectiveness might be, if learning is not contributing to the results of the organization, then the other claims are hollow indeed. Only the “business results” claim should be the source of much pride. The other claims might be enablers of results, but we should be targeting the results.

This is why it is not uncommon that “superb results” can be achieved at Level 1 (“This was the greatest course I ever attended!”), at Level 2 (scoring 100% on the post-test), and at Level 3 (the supervisors say that their employees are using the new skills on the job), without having any impact whatsoever on business or organizational indicators. In fact, if the wrong skills are being used and just training activity is occurring, a “success” at Level 3 can actually be a failure at Level 4!

Effectiveness should not be confused with efficiency. There is a lot of attention today to the “financial benefits” of e-learning and blended learning. At IBM, we know that e-learning and blended learning (a combination of e-learning and classroom learning) are less costly than classroom learning alone; that is, they are *more efficient*, and we have compelling evidence to back it up. As important as efficiency might be, effectiveness is a lot more important. Effectiveness has to do with getting the right results; efficiency relates to cost. It is vital for us to realize that, if one is not getting the right results, it doesn’t matter how little it costs! As management guru, Peter Drucker has explained, “There is nothing as useless as doing *efficiently* that which should not be done at all!” Another way of viewing this is that reducing the denominator of the ROI formula is of very little value if the numerator is zero, or nearly so; dividing lower costs into zero benefits still yields a zero ROI! Whether driving costs out or not, the key to high ROI of learning is the business benefit of the investment.

While efficiency relates more to delivery, effectiveness has to do with the outcomes due to the *content* of learning. Learning Effectiveness Measurement is primarily concerned with increasing the *effectiveness* of learning content, regardless of the delivery system.

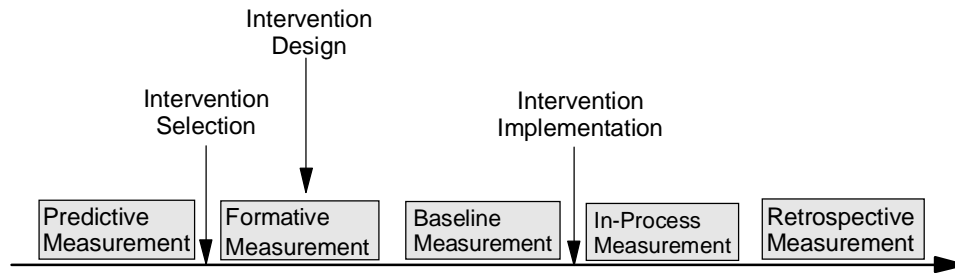
The dual benefits of the right learning content and efficient learning delivery are highlighted in the following diagram:



Bottom line: Companies that are able to deliver business-critical content to employees in the most efficient manner will be the winners of the 21st Century! That's what LEM is all about: Helping organizations like yours achieve business results from learning, not just tracking it after the fact.

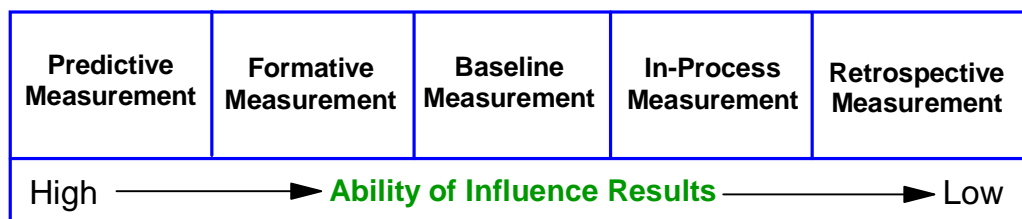
A Brief Overview of Learning Effectiveness Measurement

There are five phases of Learning Effectiveness Measurement, as shown below:



1. **Predictive Measurement**, which should be done *before an intervention is selected or designed*, helps to make the best learning investments, target the highest leverage performance improvement opportunities, and provide crucial data to increase the effectiveness of intervention design.
2. **Formative Measurement**, which should be done during intervention design, makes sure that predictive measurement data is implemented in the intervention design and implementation plan so that maximum effectiveness can be realized.
3. **Baseline Measurement**, which should be done *before the intervention is implemented*, identifies pre-implementation measurements and a target value for each measure.
4. **In-Process Measurement**, which should be done *during the implementation of the intervention*, tracks intervention effectiveness during deployment and enables corrective actions (if needed).
5. **Retrospective measurement**, which should be done *after the intervention is fully implemented*, collects post-intervention data and enables final evaluative decision-making.

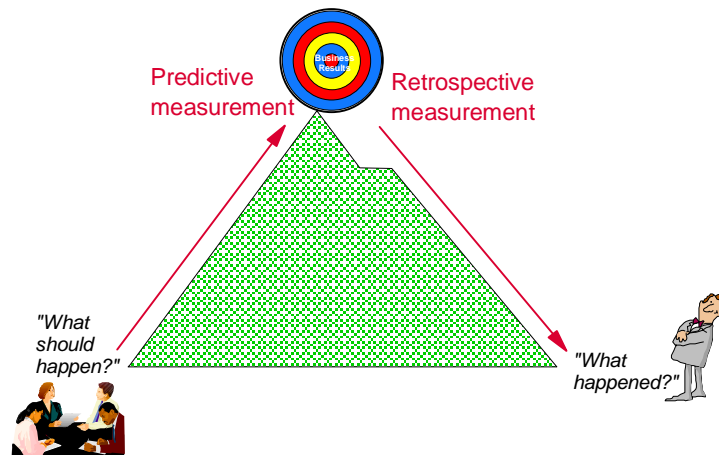
One of the most important distinctions between the five LEM phases is the relative leverage of the measurement – its ability to influence results. As shown below, Predictive Measurement has the highest ability to influence results, while Retrospective Measurement has the least.



Now let's take a closer look at the LEM phases, with particular focus on Predictive Measurement, which is the cornerstone of methodology.

Predictive Measurement

Learning Effectiveness Measurement is predicated on the belief that measurement should be used actively (actually, pro-actively) to produce the kind of results we desire. Like a roadmap, it should be used to select and navigate to your destination, not just be used to confirm that you have arrived or not! This requires a transformation of the traditional view of learning measurement from being predominantly *retrospective* to being predominantly *predictive*. Predictive measurement asks, “What should happen?” while retrospective measurement ask, “What already happened?”



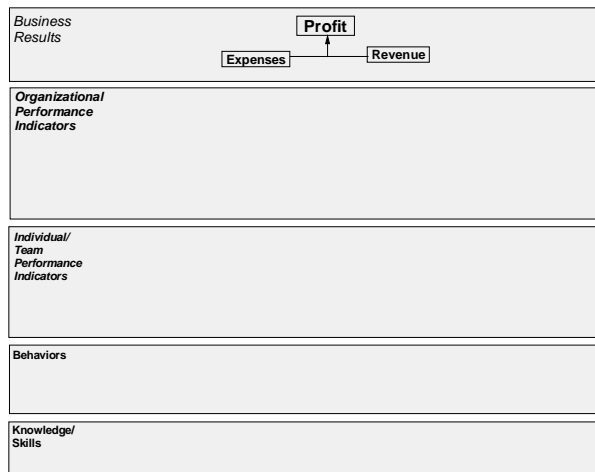
Most people are somewhat skeptical about any discussion of measurement that relates to pre-intervention analysis, because they think of measurement as something that happens later, and seldom think of analysis as being a form of measurement. Since “What you measure is what you get,” it is very difficult to expect learning that wasn’t specifically designed to achieve business or organizational impact to get it. Measurement is crucial for establishing an expectation, or target, for impact.

Predictive measurement occurs early in the learning planning cycle and helps decision-makers make the best learning design and investment decisions. Waiting to measure until after the intervention is selected and designed causes the greatest value of measurement (to drive results) is lost!

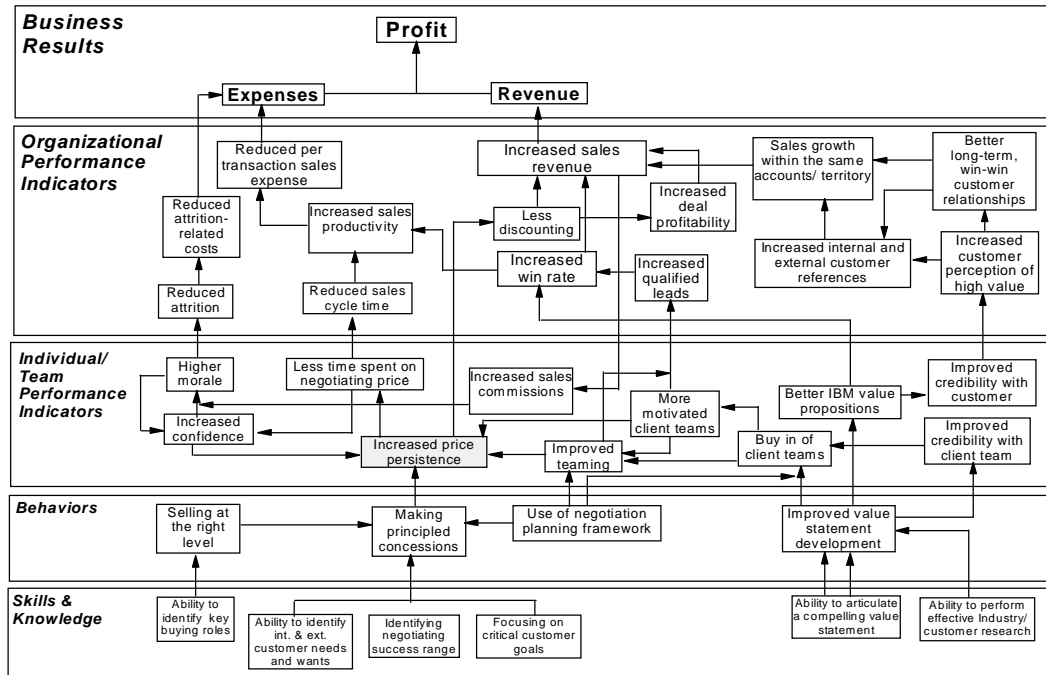
In order to achieve results, learning must be *aligned* with results. However, most of the time, desired results are poorly defined. Too often the desired organizational impact, if it is ever defined, is disconnected from the learning objectives. Therefore, one of the biggest challenges in learning is how to bridge the gap between learning interventions and real organizational impact. To bridge this gap, a systematic process is needed in order to trace the *chain of causality* between typical learning measures and business measures. In order to measure and attain business results through learning interventions, it is crucial to understand the intermediate relationships, even if the understanding is initially incomplete. In LEM, this is done through the use of “causal chains.”

Causal chains are diagrams that are used to trace the impact of learning through a “chain” of causes and effects – from skills, knowledge and attitudes to behavior to individual/team performance to organizational performance, and culminating with financial business results. The causal chain represents a sort of “map” composed of a hierarchy of indicators linking learning with business results. This causal understanding has long been the missing link in learning that attempts to achieve a business impact. Not only does this causal logic help identify measures that can be used for tracking business impact, but more importantly, it provides critical linkages for driving that impact. One thing is certain: a learning intervention is unlikely to ever have an organizational impact if it doesn’t connect the critical links in a causal chain.

To develop causal chains, a five-tier template is used. This template is depicted below:



Using this template, and through an interactive, iterative process, a causal chain diagram is developed. An example of a causal chain is depicted below:



Causal chains also don't have to be fancy. They can be roughly drawn on a scrap of paper or a cocktail napkin and still serve their purpose. It is not the diagram that is important; it is the understanding that is developed through the process of developing the causal chains. This causal understanding has long been the missing link in learning that attempts to achieve a business impact. Not only does this causal logic help identify measures that can be used for tracking business impact, but, more importantly, it provides critical linkages for driving that impact. As you move up the chain of causality, you will be able to demonstrate the "business logic" of the intervention to the client and the organization. Business logic describes how results are achieved in particular area of the business being analyzed.

One of the major factors discouraging efforts to link training with business results has been the perceived need to *isolate* the effects of training from other causal influences. In rigorous research this might be warranted. However, one of the keys to high-leverage interventions is the synergy among intervention components. Business logic is based on the concept of *contributory causality* – the realization that organizational results are caused by the confluence of multiple influences – and that no function or intervention is solely responsible for any business result. In an applied business or government context, no function should be required to rigorously isolate its impact or the impact of an intervention from other potential contributing factors. Doing so will tend to undermine collaboration and the potential for synergy.

In causal chain development, the process is as important as the product. The dialogue that is generated through the development of causal chains is extremely beneficial in many ways. Causal chains provide a common language that learning consultants, education sponsors, and executives can use to collaborate for achieving higher impact learning

interventions. Furthermore, the more “learning people” work with business logic, the more attuned they will become to the business and business drivers. This will ultimately have a profound impact on the business literacy of learning professionals in any organization.

Causal chains should also be viewed as a "set of hypotheses," and not established facts. As such, they are subject to being refined over time as causal relationships are verified or discounted, which leads to many insights into learning and its interaction with other business drivers. As they are refined, causal chains also become extremely valuable, reusable intellectual capital for the units that develop them and for the organization as a whole.

Causal chains also help identify key leverage points (indicators that appear to have the greatest impact potential) and critical factors for increasing the success of learning interventions. These key leverage points and critical success factors become the most crucial intersection point between LEM and intervention design.

The next step in Predictive Measurement is to identify measures to target and track. Everything on a causal chain does not have to be measured, but the indicators “on the critical path” to business impact should. These become the basis for the Measurement Plan. Although the focus of LEM is on Level 4 measurement, measures at all levels are typically included in an LEM Measurement Plan. In selecting the best measures, emphasis is placed on alignment between the proposed interaction and desired results, ease of measurement, and accessibility of data.

Baseline Measurement

The next phase in LEM is Baseline Measurement. One of the biggest mistakes made in learning measurement is the failure to collect baseline data. Without baseline data, no before-and-after comparisons can be made, and it is impossible to know if there has been any improvement. Furthermore, without baseline data, credible learning measurement targets can not be established. Without such vantage points, learning professionals are often designing interventions without knowing how much improvement they want and in what areas. This is like “shooting in the dark” – not a very good idea – either with a gun or a learning program!

If relevant data is being continuously tracked in the organization, baseline data should be relatively easy to collect. Unfortunately, if data collection is time-consuming, most learning professionals and their clients are reluctant to invest their scarce resources in collecting measurement data. This is a serious mistake that has come back to haunt most learning functions that fail to track the effectiveness of their learning interventions – and, without baseline data, no meaningful measurement comparisons can be made.

Formative Measurement

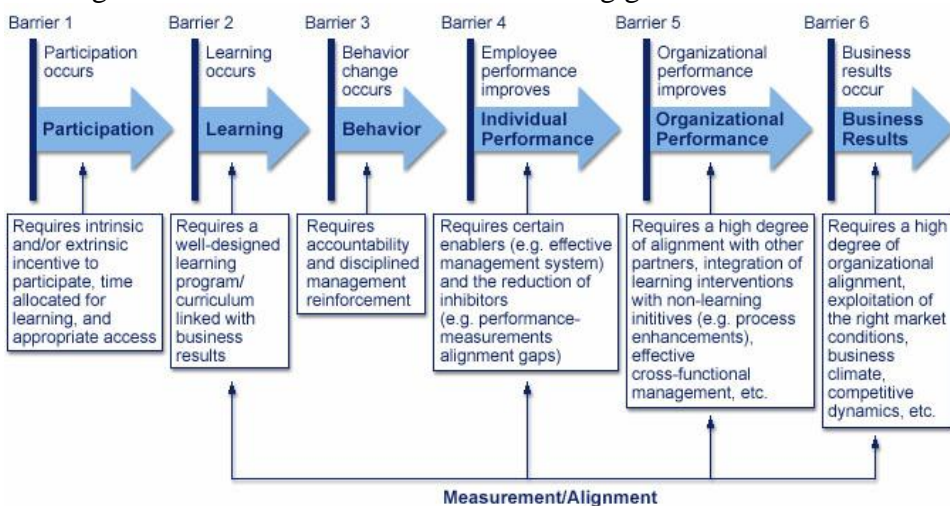
Formative Measurement involves the review of the intervention design to ensure that the intervention and its implementation plan are powerful enough to achieve the desired results identified in the Predictive Measurement phase, especially with respect to the critical success factors.

In order to achieve business impact, learning must overcome the many barriers that prevent the potential chain of causality from being realized. The following diagram shows all the places where barriers to achieving business results can occur.



Even if a learning program is “well-designed” in the traditional sense, target learners might not participate in the learning program, learning might not occur, learning might not result in behavior change, behavior change might not improve employee performance, even if employee performance improves it might not impact organizational performance, and organizational performance improvement might not be reflected in the financial results of the business or government agency. Only when these barriers to impact are overcome can real results from learning be achieved. This chain of impact, and all the potential break-points in it, provides some insight into why skepticism about current learning ROI claims is justified.

However, making the right design and implementation decisions can promote high-ROI learning interventions in line with the following generic recommendations:



[For more on this issue, please see the author's web lecture on the ROI of learning: <http://www-3.ibm.com/services/learning/solutions/ideas/weblectures.>]

The previous graphic shows that *measurement* and *alignment* are crucial for achieving learning, behavior change, individual performance improvement, organizational performance improvement, and business results. This is where LEM Predictive and Formative Measurement really shine.

Focusing on behavior change, performance improvement, and business measures, rather than just learning measures, significantly changes the “rules of the game” for intervention designers. Intervention design is no longer just a matter of disseminating knowledge and developing skills. The challenge is to develop effective instruction that is “wrapped” in a package that might include non-learning components as well. It is virtually impossible to make a significant impact on business measures with instruction alone.

In-Process Measurement

During the implementation of an intervention measurement data should be collected. Just because an intervention has been carefully designed to meet the learning and performance requirements doesn't mean that it will be as effective as anticipated once it is deployed. The frequency of in-process measurement is dependent on the criticality of the intervention. This data should provide timely feedback on how well the intervention is working, on possible problems that might require some corrective action, opportunities to further enhance the intervention, or, in rare instances, discontinue it.

In-Process Measurement is high-leverage because it typically requires little effort and can provide extremely valuable, ongoing feedback. Traditional measurement typically occurs too late for such decisions and remedial action to be taken. In order to maximize effectiveness, measurement should occur throughout the intervention lifecycle – from initial conception to the end of deployment. In order to maximize effectiveness, interventions should be measured throughout their lifecycle – from initial concept through to full deployment. Remember: Without measurement, it is impossible to manage anything and the earlier we start measuring, the more leverage we can get from the measurement.

Retrospective Measurement

Retrospective Measurement is final measurement that occurs at the end of the intervention deployment. This does not necessarily mean that the intervention is terminated and taken out of service, but that it has reached a point at which the intervention is sufficiently mature that it can be retrospectively measured. It can also be considered the last in-process measurement point. The primary purpose of measurement at this juncture is to make *final judgments* about the intervention, including the calculation of ROI, if desired. However, Retrospective Measurement is typically too late

to inform the most important decisions the current intervention -- although these retrospective data can be used to inform decisions about future interventions.

The New Performance Partnership

By now, it should be apparent that LEM is more than just a conventional learning measurement methodology, but an approach to managing the learning and performance improvement process to achieve the desired organizational impact. The real power of LEM lies in its ability to *drive* the learning, performance, and business outcomes, not just assess the extent to which outcomes were, or were not, achieved.

However, to be successful, LEM will benefit from different working relationships than those that have traditionally existed between learning professionals and line management. The emphasis on aligning learning with business results and on continuous measurement will make new partnerships desirable, if not essential. This new performance partnership is depicted in the diagram below.



For more information on Learning Effectiveness Measurement (LEM) and how you can implement it in your organization, feel free to contact the author or the person who shared this white paper with you.