

Webinar Transcript

Evaluating Intervention Impact

Slide No. 1:

Welcome to today's webinar "Elevating Intervention Impact." This webinar is brought to you by District 180 in the Office of Continuous Improvement and Support in the Kentucky Department of Education.

Slide No. 2:

Our agenda is on the screen. We will begin at the beginning – setting yourself up for success – by discussing the necessary early stages of intervention implementation, including the development of data collection and fidelity monitoring mechanisms. Next, we will discuss how to interpret the student intervention data once you have it. Finally, we will explore measures of statistical significance and discuss how student data can be used to inform future educational decisions.

Slide No. 3:

Here are our objectives for today: By the end of this training, participants will be able to establish systems for the monitoring and collection of student data, interpret student outcome data, and make data-informed decisions about the deployment of intervention strategies.

Slide No. 4:

The key to successfully evaluating the implementation of a new intervention is to set up the necessary protocols to ensure that the intervention is implemented with fidelity, monitored throughout the year, and collects data regularly and consistently. This first section will help you lay a foundation for successful program evaluation.

Slide No. 5:

The first step is to create an implementation plan. The implementation plan is the document that houses the various processes and protocols that you will use with the new intervention. This document should be created by a team of stakeholders and will help inform the work throughout the year. This document could take many forms – such as a process guide, 30-60-90 day plan, or Plan-Do-Study-Act cycle. The key is to select a format that makes sense to those who will be using it.

Care should be taken to ensure that your intervention guide is aligned to the protocols used in the evidence that led you to select the intervention. For example, if the evidence says that an intervention should be deployed three times each week for one hour, then you should seek to implement the intervention three times each week for one hour.

When developing your plan, make sure to include as much detail as possible. Your plan should include sections such as implementation protocols, data collection instruments, monitoring processes, and persons responsible.

Slide No. 6:

Embedded within your implementation guide should be a detailed monitoring plan. The purpose of your monitoring plan is to ensure that the new intervention is being implemented with fidelity. New interventions need continuous monitoring to ensure that accurate routines are established and maintained. With continuous early monitoring, interventions are more likely to be successful and become woven into the culture of a school. More monitoring up-front tends to mean less monitoring in the long term.

Your monitoring plan should include dates of potential monitoring, the individuals responsible for monitoring, the monitoring protocol (such as a walkthrough protocol or implementation task check list), and the steps that will be taken should the intervention not be implemented with fidelity.

Slide No. 7:

Finally, you will want to ensure that a comprehensive data collection protocol is included in your implementation guide. You want to build a data collection protocol that collects a wide variety of data using consistent measures. For example, you want to collect information on the dosage, or frequency, of the intervention. This could be as simple as a student log-book that records the student name, date, and duration of the implementation. Along with that, if you are using an intervention on only a handful of students throughout the year, you will want to record their entrance and exit dates. Throughout the intervention period, you will want to collect benchmark assessment data to track student progress throughout the intervention. Finally, you will want to have a pre- and post-intervention data set for each student. It is best practice to use standardized assessments, such as KPREP data or a universal screener, to collect this data.

Many programmatic interventions come with built-in data collection systems. It is important that you take time to understand the strengths and limitations of these systems before you begin implementation. It is also best practice to use an additional screener in addition to built-in or vendor-provided screeners to collect pre- and post-intervention data. This insures that we measure student progress in the content as opposed to student progress in using a computer system.

Slide No. 8:

After you have spent the year implementing a new intervention, you will have a mountain of student data to review and analyze. This data can help you make future decisions for students. In this section, we will explore different ways to examine student data to ensure that decision makers have a full picture of the impact of the intervention in the school.

Slide No. 9:

This section of the webinar will use a fictional data set that reflects many of the pieces of data discussed earlier. This data set is available for download on [KDE Evidence-based Practices](#) webpage. Pause the webinar now to download the data set.

Let's start by familiarizing ourselves with the data. The data set includes a variety of math assessment scores for fifty fourth grade students. You will find fall, winter, and spring MAP assessment data, a KPREP score for 2018 and 2019, the student's intervention entrance and exit date, as well as the intervention dosage for each student in the number of individual intervention sessions and the total number of intervention hours.

Slide No. 10:

Whenever we start with a new set of data, the best place to start is by viewing the descriptive statistics. Typically, these are mean, median, mode, standard deviation, and range. These statistics give us a good overview of the data as a whole. Take a look at the data on the screen. What does it tell you? Pause the webinar now to reflect on the data and restart the webinar when you are ready to hear the discussion.

When we compare the mean, or average, performance of our students on the various MAP administrations, we can see that, as a group, the students showed improvement at each administration. That's good, but it only tells us part of the story. If you look at the median scores, we can see that the scores didn't really move much from the Winter to Spring administration. That tells us that some of our students are moving much faster than others. This same finding is reflected in the Standard Deviation and Range calculations. We can see that from Fall to Winter our students moved as a group because these scores are lower, but between Winter and Spring they spread back out.

Looking at the KPREP scores we can also see that the mean score grew dramatically from 2017-18 to 2018-19; however, we see that the standard deviation and range both increase for this group of students. That tells us that something might be up with this data.

If we look at the means alone, we may think that this intervention had great success for our students, but when we consider the range of data, we know that we need to look a little deeper before making a decision.

Slide No. 11:

Sometimes it is easier to view the data as a distribution. On the screen are three box and whisker plots, each representing a MAP test administration. The bold line in the middle represents the median scores. Just as we saw on the last slide, the median score grew dramatically from Fall to Winter, but stayed relatively flat from Winter to Spring. The bottom half of the box represents the bottom half of our scores. We can see that the group of students scoring in the bottom half of the data set is much smaller in Winter than it was in the Fall, but doesn't really change much

in the Spring. We can also see that, for about half of our students, the intervention continues to work between Winter and Spring.

Now we have some more information to consider about the intervention. Our challenge is to find out what happened. Why did this intervention continue to work for some students and not for others? Were there changes in implementation fidelity? Is it more cost effective to limit the dosage to only one semester? We need to dig deeper here.

Slide No. 12:

A good next step is to check for correlations. Correlations help us see if there are any relationships between the variables we are considering. A correlation chart is presented on the screen. What does it tell you? Pause the webinar now to reflect on the data and restart the webinar when you are ready to hear the discussion.

Remember that correlations are on a scale of negative one to positive one. We can see that the Fall scores have a positive correlation of one to Fall Scores – because they are the same variable. You can also see that Dosage – Sessions has a positive correlation of one to Dosage – Hours. That makes sense because the dosage hours is directly tied to the number of sessions a student receives.

On the last slide, we hypothesized that dosage may be a factor here. This correlation chart continues to point us in that direction. You can see that dosage (in both instances) has a negative correlation of 0.25 with the Fall MAP scores. That makes sense, because the students have not participated in the intervention yet. In the winter, dosage has a negative correlation of 0.05 with dosage. That is pretty close to zero, but we should take note that it did change significantly from the Fall, so something is going on there. Finally, we can see in the Spring that dosage has a negative correlation of 0.12. This would suggest that continued participation in the intervention from Winter to Spring may have had a negative impact on the students.

You can also see that Entrance Date plays a role here. There is a negative correlation of 0.12 between Entrance Date and Dosage. This makes sense because students who entered later in the year would have lower dosage than students who entered earlier in the year. Entrance Date has a positive correlation of 0.11 with the Fall test scores. Again, this makes sense because we can assume that these Fall scores played a role in which students were selected to participate in the intervention. Finally, we can see that Entrance Date has a negative correlation of 0.19 with both the Winter and Spring MAP assessments. While this isn't a very strong correlation, we can see that Entrance Date can have a negative impact on student scores.

Slide No. 13:

Since we think that Entrance Date may be a contributing factor, it may be beneficial to view the student scores divided out by the month they started receiving the intervention. The chart on the screen shows the correlations for only the Entrance Date variable. The full correlation charts are in the corresponding Excel document for your use.

This detail gives us a slightly better picture of what is going on. You can see that students who began the intervention in September have a positive correlation of 0.21 with the Winter MAP Score data, but a negative correlation of 0.15 with the Spring MAP Score data. This suggests that for students who began the intervention in September, the impact of the intervention was relatively strong on their Winter MAP Scores, but continued use had a negative impact on their Spring MAP Scores. We see a similar trend in the October and November starts. Perhaps intervention fatigue is an issue here.

I think we now have enough data to say that students can have too much of this intervention and that dosage matters.

Slide No. 14:

Now that we have made some determinations about whether or not the intervention has worked for our students, it is time to decide how much the intervention has worked. Let's use KPREP scores to examine this. KPREP scores give us a reliable pre-test, post-test measure of the impact of the intervention.

The two measures we want to consider here are the t -stat, calculated with a paired t -test, and the effect size, calculated using Cohens d . The results for both tests are on the screen and in the corresponding Excel document.

You can see from the chart that the t stat of -16.94 is statistically significant because the p value is far below 0.05. In fact, in this instance, the p value is virtually indistinguishable from zero. This tells us that this intervention had a very strong statistically significant effect on the student outcome.

The effect size is 3.39. This is a large effect size.

I think it is safe to say that this intervention had a positive impact on our student's KPREP scores, moving the average score for these students from 196.76 to 208.96. We can see from our original data set that the proficiency rate for math on KPREP is 210. Our student's didn't quite make it to proficiency but are much closer than they would have been otherwise.

Slide No. 15:

After we have completed a thorough data analysis, there are a few other data points that we may want to check before making any decisions about the intervention. If we had access to a full data set, we may want to compare the progress of students who did not receive the intervention to those that did. We also noted a change in performance from Winter to Spring MAP administrations. We may want to check our monitoring and intervention records for any fidelity issues. Finally, this analysis presents only one interpretation of the data. Other professionals may disagree with our interpretation – and that is okay. We should ask someone we trust to review the data and give us feedback. Due to the limitations of our fictional data set, we will not explore these questions in this webinar.

Slide No. 16:

Once we have asked as many questions as possible from the data set, it is time to put it all together to make decisions for our students. Specifically, we want to decide if, and how, this intervention will be used next year.

Slide No. 17:

When you are ready to make a determination about an intervention, there are a few considerations. First, we have to decide if we want to use the intervention again at all. Sometimes this answer is very clear – for example, if student scores stayed the same or went backwards, we would probably decide to discontinue the intervention. However, in some cases, such as this one, we have more nuanced results. This may lead us to consider changes to things like dosage, student assignment, the intervention timeline, assessment mechanisms, and fidelity or monitoring procedures.

Slide No. 18:

When we consider those questions for this fictional intervention, the data analysis gives us some helpful information. First, will we use the intervention again? I think so! This intervention had a statistically significant and positive impact on student KPREP scores, which served as our summative pre- and post-test. It also had a very large effect size. The next question is, do we need to make changes to our implementation of the intervention based on this data? Yes again! The data shows us some clear trends that we can address.

Slide No. 19:

Here are some of the data driven changes that you might make based on this data set. First, let's look at student assignment. Without being able to see the data for every student, it has hard to say for certain that our student selection process was good; however, nothing in this data set tells us that there is anything wrong with our student assignment. So no changes will be made next year.

We identified some issues with the timeline. So next year, let's identify our students and start them earlier – the data suggests that waiting until November to start the intervention had little effect. We identified intervention fatigue as a possible issue also, so it may also be more cost effective to cohort our students and rotate them in and out of the intervention.

We used the MAP assessment as our benchmark screener and KPREP as our pre- and post-assessment. These are both reliable tests that have served us well in this data set, so no changes in assessment mechanism for next year.

Finally, we cannot say for sure that intervention fatigue is the cause of our student's slowed growth in the spring semester. We must consider the human factor here. Next year, let's increase our monitoring in the spring semester to ensure that the intervention is being implemented with fidelity.

Slide No. 20:

Over the course of this webinar, we have examined the impact of an intervention on the math achievement of 50 fictional fourth graders. We discussed the development of pre-implementation plans that led to long term success. We reviewed the data set using many different methods to explore the impact the intervention had on our students. Finally, we made a data driven decision to keep the intervention next year with a few minor changes in implementation.

This is a process that can be replicated and applied to a wide variety of programs, practices, and strategies being used in schools. When making data driven decisions about interventions, it is important to look beyond the growth in student scores. Through intentional decision making processes such as this, we are better able to facilitate lasting change in our schools.

Slide No. 19:

If you have questions regarding evidence-based practices or how to measure the impact of an intervention, please contact the District 180 branch in the Office of Continuous Improvement and Support at (502) 564-2116.