

How to Teach Mathematics and Make Adaptations Within a DBI Framework

[Slide 1 – How to Teach Mathematics and Make Adaptations Within a DBI Framework]:

Rachel Juergensen: Hello everyone. We would love to welcome you to our webinar about How to Teach Mathematics and Make Adaptations Within a DBI Framework.

[Slide 2 – Webinar Format & Questions]: Before we begin, we want to address the ways you can interact with us during the webinar. Please feel free to drop your questions or comments into the question pod and we'll try our best to monitor those during the webinar. But additionally, we'll have time at the end of the webinar to address any questions that you may have.

[Slide 3 – Welcome!]: Samantha Bos: Okay so, just to get us started I wanted to introduce myself. My name is Samantha Bos and I'm currently at the University of Texas at Austin.

Rachel Juergensen: And hi, I'm Rachel Juergensen. I'm currently at the University of Missouri Columbia. Also, on this team is Dr. Sarah Powell from the University of Texas at Austin. She's just unable to join us today.

[Slide 4]: Samantha Bos: Sorry y'all, there we go. And I'm going to turn it over to Rachel to start the beginning of this presentation.

Rachel Juergensen: Great, so this webinar is part of a three-part series. In the first webinar, we discuss tips for implementing DBI for the synchronous and asynchronous learner. And in the second webinar, we discuss student-focused assessment for the synchronous and asynchronous math learner. In this webinar, we will focus on how to teach mathematics and make adaptations within a DBI framework. If you missed any of the webinars in this series, you can access them on the NCII website. And we strongly encourage you to watch any webinars that you might have missed.

[Slide 5 – Essential Questions]: There are two essential questions that are going to guide our thinking and learning during the webinar today. The first one is what high quality mathematics instruction can you use within an instructional platform? And the second essential question is what instructional adaptations can you make within a DBI framework?

[Slide 6 – DBI Review]: So, Data-Based Individualization helps provide the framework that either identifies students who are not responding to Tier 1 intervention or it provides a structure to help teachers identify the best practices and interventions that fit the needs of the students. The two primary components of DBI are assessment, which you can see represented in green, and instruction, which you can see represented in orange. Today we're going to focus on just the instruction aspect of DBI. But if you have more questions about the DBI model or the assessment piece again, we encourage you to go back and watch the previous webinars from this series.

[Slide 7]: Just for a quick review of DBI before we jump into instruction. Here are the steps. So, first you'll start with your instruction. We call this the instructional platform that includes a

validated intervention program. From there, you'll start progress monitoring. And then from there, you'll use information from diagnostics or other sources, like error analysis, to determine what appropriate adaptations might work for that student. And then for students not on track to meet goals, you'll make adaptations to your instruction, which is where we'll focus today. And then after you implement some of those adaptations, you'll continue to do progress monitoring to see how students are doing.

[Slide 8 – Instructional Platform]: Before thinking about adaptations to your instructional platform, let's think about your instructional platform.

[Slide 9 – Instructional Platform]: The instructional platform is like the jumping off point for evidence-based mathematics instruction. So, we would like to hear from you what kinds of things would you include in your instructional platform? So, thinking about that and if you could put some of your answers into the question or chat pod so we can get an idea of what you're thinking that would be great.

Samantha Bos: Okay, I'm seeing some people respond that they use their resource period or they use their curriculum that their district provides. I'm seeing here, some people are talking about intervention resources that they've received since the COVID pandemic has started in terms of adjusting their instruction. Thank you, guys, for continuing to drop questions. Yeah and I'm seeing explicit instructions, specialized math state standards. Those are all awesome and I appreciate you guys dropping those into the chat box. That's awesome.

[Slide 10 – Instructional Platform]: Rachel Juergensen: Okay so, thank you for sharing some of those things that you would include in your instructional platform. The research for students with learning difficulties points to six important components that should be included in your instructional platform. These include instructional delivery components, such as explicit instruction, multiple representations and using precise language. And it also includes some instructional strategies like fluency building, problem solving instruction and then a motivation component. Today we're going to talk about two of the components in depth and you'll see those circled on your slide in red. Those are explicit instruction and multiple representations.

[Slide 11 – Evidence of the Practice]: Explicit instruction and multiple representations are two of the most well researched components for mathematics instruction. Both of them have a strong evidence base for students with learning disabilities or students who struggle with mathematics. And both of those components can be found in the IES Practice Guide for Struggling Learners. And there are hundreds of research studies to support using both explicit instruction and multiple representations.

[Slide 12 – Explicit Instruction]: Samantha Bos: Okay thank you Rachel. I'm now going to talk about explicit instruction. So, here we go. Regarding explicit instruction, we're going to start with that. And I just want to show you guys first up here in the corner, we see that movie icon and if you see that on any slide that indicates that there are STAIR tailored videos on YouTube about this topic and we'll have more information about that at the end. But we encourage you guys to go back and watch some of these videos for more information.

[Slide 13]: This is the model used by the National Center on Intensive Intervention to show the components of explicit instruction. We're going to walk through the core components of explicit instruction, and when we're done, you'll have a chance to apply this model to your own lessons.

[Slide 14]: So, first we're going to talk about the modeling aspect of explicit instruction. Modeling includes the think aloud or that “I do” portion of explicit instruction and includes the goals and steps for solving a problem. Modeling is really a teacher-guided conversation and should involve student discourse and thinking. In addition, while you are modeling these steps you should be focused on precise mathematical language. And we're going to talk about that more towards the end of this presentation.

[Slide 15]: A big part of modeling and explicit instruction is using planned examples. So, you can see here in this modeling example, there are identifications of a goal. There are steps, models for students to see and the use of precise language. So, I'm going to read through this. You guys can hear both the “I do” portion of this modeling as well as the language used. How it's really clear for students to follow along. So, for example to solve twenty-six plus seventy-nine, I first decide about the operation. Do I add, subtract, multiply or divide? Asking students to really engage and think about what it is they're doing. The word plus tells me to add. Adding means to combine two quantities. I know that I can decompose twenty-six and seventy-nine and use the partial sum strategy. What great language is happening on right here; decompose, that's awesome.

First, I add twenty plus seventy. What's twenty plus seventy? And this is a piece where you can get the students involved. Have them answer that question and then you can pair it back twenty plus seventy is ninety. I write seven, I write ninety right here. Then I add six plus nine. What's six plus nine and ask the students. Get that engagement piece. Six plus nine is fifteen. So, I write fifteen here. Finally, we add the partial sums ninety and fifteen. Ninety plus fifteen is one hundred and five. So, twenty-six plus seventy-nine equals one hundred and five. So, you can see it's a very clear explanation for students to follow along.

[Slide 16]: It is also important for you to use planned examples that are purposeful and not spur of the moment decisions, as muddy examples can confuse students. You want to make sure that you incorporate a variety of ways of seeing the same math content, as you can see above when I show division in multiple ways. And you may also want to incorporate non-examples into your modeling.

Look at the bottom of the division problems and you can see that I included a subtraction problem in there as a non-example. Research shows that students often confuse operation symbols, so it's important to provide them with practice and differentiating between symbols including between division and subtraction here.

[Slide 17 – Teacher and student practice together]: Now to practice. Practice is where students really learn mathematics. The most important type of practice is practice where you and the students are working together to solve math problems. This is often referred to as the “We do” portion of practice or the guided practice.

[Slide 18 – Student practices with teacher support]: Another helpful type of practice is independent practice. Students are solving problems on their own, but you are there to support them. This is often referred to as the “I do” portion of explicit instruction.

[Slide 19]: As you are continuing to model and practice with your students there are supports that run throughout your lesson to help you stay planned, organized and really focused. These support practices are, like I said, are going to carry throughout both the modeling and practice portions of the lesson. And since you don't have much time with your intensive intervention, you really need to maximize it by asking the right questions, including a mix of low and high-level questions.

Eliciting frequent responses including class-wide individual partner responses and providing a variety of mediums for students to respond. Including writing on paper, writing on whiteboards, using thumbs up using virtual responses depending on how you're teaching right now. And it's also really important especially in today's virtual world that we're continuing to provide feedback that is immediate, specific and affirmative and corrective. And we need to be maintaining a brisk pace that relies, really, on us being planned and organized. And especially as we talk about in the virtual world, it's really important to keep that engagement high and maintain that really brisk base.

[Slide 20]: Even though the original model shows an even division between modeling and practice, different lessons may have more or less of each component. For example, when introducing new material there will likely be a great deal of modeling that day. On days when you're reviewing, there likely will be significantly more practice. We just want to emphasize that this model can be flexible to meet the needs of your lesson for that day. But we do want to be including modeling, practice and supports throughout.

[Slide 21]: For those of you at home or who are watching this video afterwards, after it's been recorded, please click on the link provided in your handouts. For those of you watching with us live, make a note to come back to the slide after the presentation. And for the sake of time we will not play it now, but this video is a great example of explicit instruction in action. So, we encourage you to come back and check it out.

[Slide 22 – Explicit Instruction Essential Components]: To help ground everyone in math, we have provided both a blank and a completed Explicit Instruction and Essential Components Guide in your handouts packet. That includes an example lesson in which the teacher is walking through integrating word problem solving using positive and negative integers alongside both expressions and equations. The completed Guide or the completed form, like I said, it's in your handouts. But the purpose of these Essential Components Guides is to help us really be purposeful in our planning and anticipate any challenges that we may have in teaching material to students.

So, for example when you're modeling these are really important questions to think about ahead of time. What are my goals for this lesson? What vocabulary and skills are prerequisites to understand this concept? Am I breaking down this concept into appropriately sized chunks that students will be able to understand? How will I elicit and connect with students' prior knowledge and address any misconceptions? What will my step-by-step demonstration look

like? Really thinking through that example is important. What examples and non-examples will I be using? What clear and concise mathematical language will I use? When thinking about practice, thinking about how will I scaffold the guided practice to gradually increase the difficulty of task while decreasing the amount of teacher guidance. How will I know students are ready to move to independent practice?

And then thinking about those supporting practices throughout. What low and high-level questions will I ask throughout the lesson? Having those prepared ahead of time is really helpful. In addition, is the lesson well sequenced, focused and has a brisk pace? How will I structure my lesson to include frequent responses and opportunities for me to monitor my students understanding and provide meaningful feedback? These are all questions that are really important for us to think about before we start a lesson, so that way we don't have to figure it out as we're going. If you have this planned out and you can really anticipate any sort of challenges, that'll help you really have a smooth and really purposeful intervention time with your students.

[Slide 23 – Explicit Instruction Essential Components]: There we go. So, another part of preparing to use these materials is to give some thought to what you might actually say or how you might actually respond to students' questions in practice. For those of you who are watching this webinar afterwards. We suggest you use the Essential Components Guide and choose one aspect of teaching in a lesson that you have already prepared, and role play that with a peer. You can start way back at the beginning where you think about what it might look like to introduce these tools to your students. You can pretend that students are familiar with the tools and practice what you might say to understand students' mathematical thinking based on representations that they make or misunderstandings that they might have.

And for those of you if you're doing this after this webinar with a peer for those of you playing the student, give feedback about what was confusing or where additional information, structure or time would have been needed. Feel free to model some common misconceptions and give the teacher the opportunity to respond. For those of you who are attending this session live, we encourage you to bring this activity; bring this handout with you to the next conference meeting or PLC time that you have with your colleagues. And you can see here, this is the example of the completed form that we provided for you so that you can see what it is that might be helpful for you to think about when you are planning out your lessons.

[Slide 24 – Want More Explicit Instruction?]: So, feel free if you are watching this recording afterwards to pause the video and check out this STAIR tailored YouTube video on more explicit instruction. If you're watching this with us live, we have a handout with all the QR codes or we encourage you to come back to the slide scan this QR code and watch some more videos that provide an even more in-depth explanation as well as more examples.

[Slide 25 – Why is explicit instruction important to use with your students?]: Alright so, I want to take a moment and pause. And let's take a moment and please let us know why you think explicit instruction is important to use with your students? Please drop your thoughts or in the question or chat pod so we can see how you guys are thinking about; regarding explicit instruction with your students. Let me open this up.

Yeah so, I can see we have explicit instruction and it's important because it makes things really clear for students. I can see it's research based. Appreciate that, definitely. Let me make this a little bigger. Yeah, we can see it's very effective, it's a big, sort of, bang for your buck. Yeah, it makes your teaching more effective. Let's see. Yeah, more purposeful and more effective. A high effect size. Yeah, it provides specifics for students who are struggling, gives them the structure they need to support they're learning. All really great answers. It's important for students to have a clear explanation of expectations. Yes, very much so. Especially nowadays with everything going on, it's really helpful if students can understand exactly what they need to be doing to be successful. So, thank you guys for dropping those in the chat box.

[Slide 26 – Multiple Representations]: We're going to move now on to multiple representations. That was just a real quick sort of crash course on explicit instruction. And now we're going to talk about a strategy that you can use throughout all phases of explicit instruction which is multiple representations.

[Slide 27 – Multiple Representations]: There are three primary types of multiple representations: concrete, pictorial and abstract. And while students often develop the use of these representations in a particular order, we wanted to point out that the representations are not in a hierarchy and can be used by any students at any grade level working on any type of mathematics, so we wanted to really show that purposefully that you can have high schoolers working with concrete manipulatives. That's all good. There's no sort of one way to go about this.

[Slide 28 – Three-dimensional objects]: To provide some quick examples, concrete representations are three-dimensional objects. They physically represent- sorry about that. I got too excited. There we go. They physically represent the mathematical concept. And here you can see a Geo Board representing a triangle, some algebra tiles representing an expression or equation, and a cone to represent that three-dimensional or it is a three-dimensional object.

[Slide 29 – Two-dimensional Images]: Pictorial representations are two-dimensional images. And you'll notice here instead of the Geo Board, there's a drawing of a triangle. Instead of physical algebra tiles, there are algebra tiles on an app. And instead of a cone, there's a drawing of a cone, so we've moved it two dimensional.

[Slide 30 – Numerals and symbols and words]: Abstract representations include numerals and symbols. You'll notice here that the same concepts that were represented both concretely and pictorially are now represented here abstractly. So, we've just continued talking about the area of a triangle, talking about representing expressions, and then talking about the volume of a cone. This is just the abstract way to view that. So, this is the most common representations that students are introduced to and interact with.

[Slide 31 – Multiple Representation: Aren't Those for Elementary Kids?]: There is current research about the use of multiple representations with students in the middle school grades who are learning grade level content. We're happy to share this article with you if you're interested in reading it, but we wanted to address the concern that manipulatives and other types of representation activities might be considered to be elementary. As we continue with today's session, you can see we have intentionally included examples that highlight how these can apply

in the middle school grades, in the high school grades, and really with those more advanced abstract concepts.

[Slide 32 – Multiple Representations Essential Components]: Just like with explicit instruction, we have an Essential Components Guide that we provided for you, both a blank copy as well as a completed example using multiple representations. This is intended to help you plan and anticipate students' needs, anticipate where the lesson is going to go, anticipate what bumps you may come up against, and proactively reflect on how you can plan for this learning. So, let's go ahead and look at some of the key components that you want to think about ahead of time. For example, thinking about first, what's the mathematical concept that you're teaching, that you're using these manipulatives or these pictures and drawings for? Is the purpose of using a representation to teach this mathematical concept clear? Meaning, is it aligned with what you want the students to learn? Have I chosen a representation that accurately represents the mathematical concept?

So, being really purposeful in your choice of manipulatives or drawings. What knowledge and skills will students need before using this representation? Really thinking about building those prior knowledge skills or sort of whatever skills that are necessary to help students be successful in the moment when they're focused on the mathematical content. What are some potential misunderstandings students might have when using this representation? And then finally thinking through what are some logistical considerations I should make before the lesson. So, today thinking about how do I put this in place in the classroom? How do I put this in place virtually? It's really important to think through that and plan ahead of time.

[Slide 33 – Multiplying Linear Expressions Part 1: Using Algebra Blocks]: This is a tailored video that demonstrates one idea from the Strickland articles which we referenced earlier. Which is how to use Algebra Blocks, excuse me, to model linear expressions. If you're watching this as a recording, feel free to hit pause and watch this video and you'll notice that different blocks are available in this set. And you can start thinking about how you might introduce these blocks or how you can introduce these concepts with your students. If you're here with us live, please note this slide and feel free to come back to this QR code later on. Or you can scan it now and go ahead and watch it later. But it's a great set of videos about really using multiple representations.

[Slide 34 – Want More Multiple Representations?]: And while we're on that topic. We've done a lot of rich learning today. But it's okay if you want to hear more information or if you want to see more examples. Sometimes it really helps to see these practices put into play. So, we really encourage you to check out the YouTube STAIR tailored channel where we have tons of videos on how you can use multiple representations in your classroom.

[Slide 35 – What are some of your favorite hands-on or virtual representations?]: We want to pause now and hear your thoughts and reflections. What are some of your favorite hands-on or virtual representations? And feel free to drop those in the chat pod. Okay, the Ten Frames. Yes, definitely, definitely, definitely. Okay and I see someone tried to scan the QR code and it didn't work. So, what we'll do is we'll make sure that these are updated, and it might be since we're blowing it up on a big screen, that might be where some of the issues are coming from.

But we'll make sure that you guys have access to all of the YouTube channel videos and all of the QR codes [Note that the QR code in the slide deck has been fixed]. Yeah, Digital Ten Blocks. Yeah, you can break them apart recombine them. I'm a big fan of the Two-Colored Counters. I can see in there, you can use Algebra Blocks. Using Microsoft Whiteboard yes, definitely helpful. Thank you for throwing that out there. Yeah, Algebra Tiles. Everything from combining like terms to equations using operations with polynomials. Definitely, there are so many. Yep Algebra Tiles, Unifix Cubes, Virtual Algebra Tiles definitely. There are a lot of really great manipulatives out there. And I think that there is a growing set of virtual manipulatives that are being developed to really help us address the needs right now.

[Slide 36]: So, next for the sake of time we're not going to discuss these questions in depth, but if you're watching this video remotely afterwards especially if you're watching this during a PLC meeting or with a team, we really encourage you to discuss these questions with your other colleagues and be purposeful in incorporating explicit instruction and multiple representations in your classroom. If you're watching this live with us, we really again encourage you to sort of take these questions with you, bring them to your next PLC or bring them to your next planning period so that you can talk about these aspects or reflect on these and be purposeful in how you want it to implement explicit instruction or multiple representation.

So, how do you see either explicit instruction or multiple representations fitting into what you're already doing? We don't want to burden anyone. We want to make sure that this is seamless and that we are incorporating and building on our strengths. What do you see as possible challenges using explicit instruction are multiple representations? Thinking through what the challenges are. And then, how we can address them is really important. So, the next question is how will you address those challenges so that that way you can be proactive and hopefully be more successful in implementing explicit instruction or multiple representations?

[Slide 37 – Instructional Platform Adaptations to Platform]: Just to review the instructional platform is the jumping off point for evidence-based mathematics instruction. The research for students with learning difficulties or students who struggle with math points to six important components of the instructional platform, and today we covered two of the most important. Once you have a solid instructional platform in place, if you see students are not improving as needed, then you should think about adapting your platform. So, we do that after we progress monitor data and you determine whether or not it's sufficient or it needs adaptations. And I'm now going to turn it all over to Rachel who's going to tell us some more about intervention adaptations or instructional adaptations.

[Slide 38 – Instructional Adaptations]: Rachel Juergensen: Thanks, Sam. Okay so, the instructional considerations that we just talked about are part of a framework of high-quality mathematics instruction for students with mathematics difficulty. However, even with those components in place you might find that there are students who require more intensive supports. So, when intensifying instruction, you might consider any one of the following six instructional adaptations.

[Slide 39]: The first one is implement with greater fidelity. The second one is embed with behavioral supports. Then increase dosage, adapt mathematics content, utilize explicit instruction, and the last one we'll talk about briefly today is explicitly teach for transfer.

[Slide 40 – Implement with Greater Fidelity]: The first instructional adaptation is implement with greater fidelity. So, to ensure high fidelity to an intervention it's helpful to create a checklist of the key components of that intervention. This list might be provided in the intervention's manual or it might need to be created. If the checklist needs to be created, the original research team could be contacted to help or the teacher can create one by identifying those key components that impact student outcomes within that intervention.

[Slide 41 – Embed Behavioral Supports]: The second instructional adaptation is embed behavioral supports. So, we always want to reinforce the behavior we want to see. For example if a student is struggling to stay focused during mathematics, the behavior you want to see is focus. But what does that look like? What does that sound like? Focus needs to be operationally defined so the teacher knows what to look for and the student knows what is expected of them.

Once that expected behavior is defined and communicated with the student a reinforcer needs to be decided upon. There's no such thing as a universal reinforcer and, because of this, it's important to find out what that particular student finds reinforcing. For some students this might be something tangible. For other students it might be something like time spent with a peer or time spent with a teacher. Once that reinforcer is decided upon the intensification can begin.

[Slide 42 – Increase Dosage]: The third instructional adaptation is increasing dosage. So, dosage is the amount of an intervention the student receives. It can include the number of opportunities to respond within a session, the number of sessions, the number of days per week the intervention is provided, or the number of weeks overall that the intervention is provided. The purpose of intensifying the dosage is to determine the appropriate combination of intervention frequency. So, how often the intervention is being provided and the duration. How long is the intervention being provided for that particular student?

[Slide 43 – Adapt Mathematics Content]: The next instructional adaptation is to adapt mathematics content. The purpose of doing this is to ensure that students are able to access those core mathematics concepts. This can include adapting the way you present the material. Teachers can focus on using precise language, like Sam talked about earlier, scaffolding activities, or teaching strategies like word problem solving attack strategies.

Some students might require more intensive support and teachers can adapt the scope and sequence of the units to ensure that that critical content is targeted and built upon that student's understandings. One important thing to keep in mind with adapting mathematics content is that if you are significantly modifying the mathematics content for a particular student, that will require a conversation with that particular student's IEP Team.

[Slide 44 – Utilize Explicit Instruction]: The next instructional adaptation is to utilize explicit instruction, which Sam talked about earlier. So, teachers should be explicit in the modeling and practicing stages in instruction. Teachers should model, demonstrate, guide students in multiple

problem-solving methods. In the model displayed on the slide instructions should be divided between modeling instruction, which means using that precise language during explanations and with well-planned and then student practice. That includes practice with the teacher as well as some independent practice. Both modeling and practice are supported by those supports underneath in the orange box, and the practices should be used throughout the instructional time.

[Slide 45 – Utilize Explicit Instruction]: The last instructional adaptation is to explicitly teach for transfer. So, that means teaching students to use skills that they've already learned on more difficult problems. For example, with the two problems that you see on this slide, you can first explicitly name the similar characteristics of the old and new problems or context. Then you might ask students to identify the relationships in the two problems. How are those two problems the same? How can solving that first problem help them solve the second problem? And then to extend this transfer, ask students to represent either problem in that abstract notation and continue to draw students' attention to how the skills and relationships in that one problem can help them with their understanding of the new problem.

[Slide 46 – Want More About Adaptations?]: Okay so, again this is a QR code that will link you to more STAIR tailored videos about these six instructional adaptations.

[Slide 47 – Remote Learning]: Now we want to briefly consider how you can take these two components explicit instruction and multiple representations into the remote learning environment.

[Slide 48 – How to Use Practices in Remote Instruction]: With just a few adjustments, these two components, multiple representations and explicit instruction, can be used in the distance learning classroom whether you're asynchronous or synchronous. So, for example when thinking about multiple representations when we're in person, that would look like using some hands-on manipulatives. But when we're in remote learning that might look like using some virtual manipulatives.

When thinking about explicit instruction in person that might look like modeling for a student modeling a problem for a student. When we're in remote learning, whether synchronous or asynchronous, modeling can still happen. So, if you're asynchronous you can model by making a video of showing that problem. Or if you are synchronous you can model using a virtual whiteboard or a document camera for your students to see that problem being solved.

[Slide 49 – Video Access]: Throughout the webinar, we've referenced several different STAIR tailored videos that will give you more information about any of the ideas that we've discussed today. If you want to quickly and easily access those STAIR tailored videos, the easiest thing to do would be to just to subscribe to our Project STAIR YouTube channel. New videos are posted weekly and we have a new series of videos coming out specifically about the use of virtual manipulatives.

[Slide 50 – Which strategies will you start to use immediately?]: To kind of start to wrap up everything we've talked about and discussed and learned today, we want to hear from you about strategies that you might have heard of that might be new or that you were reminded of that you

plan to start using with your students. And if you could put what you're thinking in the question or chat pod, we will monitor those and share some of the thoughts that you have.

Samantha Bos: Yeah, I like seeing Universal Design for Learning Principles. Thinking through how we can adapt these practices to use with all of our students; that's really great. Let's see. We're also seeing implementing virtual manipulatives; that's definitely something that we encourage. A lot of you guys try, if you haven't already, thinking about how you can use explicit instruction and multiple representations in the classroom. That's really great. Let's see. I'm also seeing using the high and low-level questions. That's awesome. We really encourage you guys to really balance students mix of sort of those comprehension questions, and then again to sort of that more abstract thinking and supporting them really developing that conceptual understanding. That's awesome. And then let's see. And then yes, yes CRA, which is another term for multiple representations or CPA every day. I love that, I love that enthusiasm. That's awesome. Yeah giving students the opportunity to really develop that conceptual understanding and that conceptual knowledge by really linking it to the real world is awesome and really provides them with a really great grounding. Yeah so, thank you guys. I'm excited to see some of these ideas that you guys are going to start right away. That's awesome.

[Slide 51 – Questions? Thank You!]: Rachel Juergensen: Okay so, before we move to time for questions, we just want to take a moment to thank the other members of our team at the University of Missouri Columbia, the University of Texas at Austin, and Southern Methodist University. We also want to thank the funders of this Grant, the Office for Special Education Programs. And we now want to open it up for questions, so if you have questions for us, we would love for you to drop those in the question pod. And we will definitely take time to try to answer those.

Samantha Bos: Yes, like Shelby. Thank you for posting in the chat box: having the tools. Which I'm assuming means multiple representations and also having explicit instructions sort of in your toolbox. Having that option from the first day of school is really key. Helping students really become familiar with the use of concrete manipulatives, the use of different pictorial drawings from the start is really awesome. And if we know it's the middle of the year now, so if this is something that you want to start it's never too late to start using explicit instruction or multiple representations. Or it's never too late if you have a really strong intervention already in place to be collecting that data. Progress monitor and make sure that you are adapting as needed. So, I see a question in the chat. What platforms do you recommend for virtual learning? Rachel do you want to take that one.

Rachel Juergensen: Yeah sure. So, if you're thinking about asynchronous learning, some platforms that I've seen work really well with teachers are things like Screencast-O-Matic, Screencastify or Loom. Those are all free options that you can use if you're trying to model some things in a an asynchronous situation, like make a video for modeling. In synchronous learning, you can think about if you use Zoom, there's a whiteboard feature that you could use for modeling. Google JamBoard is a really great resource to use if you're wanting to model synchronously. And then I've also seen really just simple ways of using your smartphone to make a document camera, where you can model something just using paper pencil or some of

those manipulatives that we talked about earlier. So, those are just some easier simpler options for different types of platforms you can use for virtual learning.

Samantha Bos: Yeah. And, Shelby made a comment that I love, combining all this with a rubric and student-friendly language that students know the expectations and what it will take to be successful. There's just so much going on right now that the more we can make things really clear to students what the expectations are, what's going to be happening, especially if you're teaching either in a virtual only or in a blended environment is really awesome. So, yeah thank you, Shelby for suggesting that the more that we can do to just sort of ease the cognitive load on students. The more that we can just sort of have them really focused on the math concepts is really great.

And I see here a question about recommended virtual manipulatives. So, we do have a database of different manipulatives that we've used. I'm going to be totally honest with you all. I'm scared if I leave this to go copy the link that I'll somehow like break down the whole thing. So, I will be sure that you guys have access to that database of virtual manipulatives, but we really encourage you guys to get creative. And like Rachel said, using the Dot Cam is really great, having students use manipulatives around their house for example, using buttons instead of Two-Colored Counters or using, you know, if they're at home and you want to figure out a way for them to represent different algebra concepts, they can just use maybe like pencils to represent the X Rod and then maybe just like little doodads or snacks or buttons or something to represent the one units. And then maybe a sticky note to represent the flat. Thinking about how we can really get creative with what the students have at home is really helpful, especially if you're in an area where maybe connectivity isn't great. Or if you're in an area, I've heard from a lot of parents and from a lot of people right now just worried about that screen time. So, if you can provide manipulatives that the students can use on their own is really great. That's the nice thing about a lot of concrete manipulatives. It is a lot of them, I mean they're representations by definition, so we have a lot of freedom to get creative with those. And I do promise, like I said, I will get you guys the link to the other virtual manipulatives and I'll do it in a way that doesn't end my whole presentation. Let's see. We've also had a question about the Project in general.

So, this project, Project STAIR, we work with middle school students or middle school math teachers. And so, people were asking about what are some of the things that they've been saying or what have they found to be helpful? And I guess something that we've heard a lot from our past teachers is that they appreciate providing that the focus on explicit instruction, multiple representation has really made them very purposeful in their instruction. So, we know right now it's really hard to, it's really hard to find time to do extra stuff, so we're not trying to ask anyone to do anything extra. We're just trying to ask you to be really purposeful in what you are doing. Let's see so, I have a question here. I Do, We Do, You Do does not really fit with the mathematical shifts supported by NCTM and NCSM, what consideration was given to those shifts? So, I'll just touch on the purpose of this project is really to focus on strategies that students who struggle with mathematics, provide teachers with those strategies to really help those kids. And so, that's really been the primary focus. And we have found that when teachers sort of integrate some of those best practices, like using precise languages, using planned examples, those really benefit all students. Rachel, do you have anything you want to add to that?

Rachel Juergensen: Yeah, I'll just add I think it's just important to always remember that one particular instructional model doesn't work for all students. So, like Sam said, the purpose of this project is to really focus on those students who might be struggling with maybe some other form of instruction that might be happening in the classroom. And to really target so that they can get those skills that they need. But yeah, just to keep in mind that not one thing works for all students and it's all about using that data to find out what does work and what is working for a particular student so that they can all be successful.

Samantha Bos: Yeah definitely. We have another question on suggestions for how to allow students to collaborate virtually? And this is I think such a huge issue right now and so I really appreciate Megan for you, for asking that question. I would say in terms of collaborating virtually, there's a couple things that you need to think about in terms of setting that expectation for the students. So, depending on whether you have little kids, if you have elementary, middle school or high school. Whichever grade level you have, you really want to make sure that again, the expectations are very clear for what they're doing in those virtual collaboration settings. If they're old enough and mature enough to be in a breakout room by themselves, I think that's a really great option for students to have the opportunity to interact with one another. Especially students who may not have other social outlets to be able to actually talk to their peers is really great.

I've seen teachers who make Google slide presentations. And so, what they do is they put every group is assigned to one Google slide page, I guess. And so, what will happen is you, as the teacher, can see what they're doing on that Google slide. And then they can also see what everyone else in the classroom is contributing to that overall presentation even if you're just asking them to solve math problems or something like that. And in that way, if you can kind of keep this sort of overview look on what the students are doing, you can jump into classrooms. If you see students who are solving incorrectly or if you see sort of that lag time where nothing's happening, you can go in and sort of check and make sure that they are really engaging as they're supposed to be. Another big thing that I've seen in terms of engaging students to really collaborate is really giving them choice. Especially for if you have some of the older students who we know it can be harder sometimes to really get them engaged and get them you know really focused on the mathematics, especially if they've struggled with math in the past. If they have a history of struggling with math and providing them with choice is really great. But I do think it really goes back to establishing expectations and practicing those expectations, and then giving yourself some grace and some patience. And that it will take time to really get the students comfortable with using these different tools. Rachel, do you have anything you want to add to that?

Rachel Juergensen: No, you said it perfectly.

Samantha Bos: Thanks, yeah. And I can see one good thing that has come out of Zoom, Teams, etcetera, you can record modeling and share with students to access anytime. Yeah, I love that idea. I've also seen if your students have access to technology you can ask them to record, maybe for that "We do" portion. So, you make a video and then you know they have to record themselves doing the same task. Or I guess that would actually be better for the independent practice. So, you do it together and then they record themselves practicing on their own.

Rachel Juergensen: And just a platform for that, I think utilizing Flip Grid is really helpful for what you just described Sam.

Samantha Bos: Yeah, and Shelby, thanks for pointing out. There are great resources to share with families making inexpensive manipulatives at home. The other nice thing is we emphasize, you know, pictorial representations can really help a lot of students and that just requires a pencil and paper or even a whiteboard. You can do that virtually with your whiteboards. So, thinking through, you don't necessarily have to buy like the latest and greatest manipulative set. You can use what's around the house. You can encourage students to draw out different ideas. That can be really helpful.

And then let's see, Shelby dropped in the chat: Edutopia about Math manipulatives, junk drawer. Yeah, use what you got. That's awesome. That's awesome, clicking through these. Okay, this is a really great question. How did we determine who qualified as students needing Tier 2 interventions? Rachel, do you want to take that, or do you want me to address that?

Rachel Juergensen: Go for it.

Samantha Bos: Okay so, in our program what we did is we were really flexible with the teachers because part of our program included a lot of Progress Monitoring data on the students themselves, so we needed students who the teachers felt would really benefit from this program and would really take it seriously. Because we did ask the students to take a couple of diagnostic tests and if you have a student who is just going to click, click, click, click, click, click, that's not really helpful for the project. So, we were really open with teachers in terms of picking students who they thought would be in attendance; have really good attendance because that's really key. Students who they felt would really participate and really benefit from the program. And then the other thing that we asked teachers is if their students had an IEP goal. Those were really the kids that we wanted to focus on, but we left it up to the teacher's discretion to think about if you just know the student is really struggling.

Hopefully, you had a chance to go and watch the first webinar on data-based individualization. Dr. Lembke and her team did a really great job talking through sort of the logistics of DBI, sort of some fundamentals of it. And they get in a little bit more deeply in terms of who should you be Progress Monitoring. Who should you be adapting your instruction to? Because you know if you're a middle school or high school teacher and you have one hundred plus kids you can't be progress monitoring all those kids. That would be insane. So, you really need to be like hopefully we've been emphasizing really purposeful is what we've been really focused on. And let's see, I am loving this chat box.

Kids learning so much on YouTube modeling videos like the Khan Academy. Or yeah, so many things nowadays you can sort of search like how to do XYZ and there's usually YouTube videos out there. We would recommend if it is a really math conceptual-based thing that you really sort of screen those for students. Something that Rachel talked about that we really want to emphasize is using precise and correct math language. Thinking through students especially students who struggle with math, if you are sort of using a bunch of different pinball terms all over the place that can get really confusing for them so you really want to make sure that if you are recommending YouTube videos or you have a source for YouTube videos that is a high-

quality resource that students can turn to. And that's why we recommend going to the STAIR tailored videos. All of the videos that we make are research based and we are very purposeful in our language to make sure that you, as teachers, can or as parents who are homeschooling can be comfortable with using the correct terminology and using the correct procedures. But yeah, and definitely, Toy Theater is awesome. That is a great resource.

Thank you all for dropping all those really great ideas in the chat box. Let me see. We have time for probably just one or two more questions so if you guys have anything else that you want to ask please feel free to drop that around in the chat. Let's see, I'll just scroll through and make sure I didn't miss any. And I like, so I guess Rachel, something I'm seeing is how would you integrate this with co-teaching? Do you have ideas on that, or do you want me to touch on that? Just because we have some co-teachers we're working with this year.

Rachel Juergensen: Yeah, I think what I would just add to that just goes back to that being purposeful in planning. And really thinking about what that collaboration might look like beforehand that would be the most beneficial for the student that you're working with.

Samantha Bos: Yeah, and exactly, just try and be really purposeful, y'all, with your time. You really want to make sure that you are really honoring your own time as teachers and instructors not, sort of, just making more work for yourself. We really want to emphasize that you are just working smarter, hopefully not harder. Everyone's working too hard anyway nowadays. So, just make sure you're giving yourself some grace, that you are collaborating with others. Let's see, thank you Shelby for all the really great resources. We encourage you to yeah, to share this with your colleagues. And as we mentioned, we had a couple of slides in here that we purposefully didn't address during this live session because we feel like they really deserve discussion time in terms of how to implement the Essential Guides. How you can be purposeful in implementing explicit instruction. And we really hope that you take this webinar, if you're attending it live or if you're watching this afterwards after it's been posted, we really hope you take the time to really pause and integrate those activities into your lesson planning time, into your conference time and really make this webinar work for you. Okay Rachel, do you have any last thoughts or anything you want to add about using multiple representations or explicit instruction or adapting them virtually?

Rachel Juergensen: I just would suggest, again, just going back to the webinars that are, yeah, the webinars that were part of this series so you can get a full picture of DBI and assessment and instruction as a whole. And just really like Sam said, taking that time to go through those activities to really reflect and think about and collaborate with your teammates.

Samantha Bos: Yeah, perfect. Okay yes, sharing it with an Algebra PLC. That's amazing, Shelby. You just made my day, thank you. That's awesome to hear. Yes, please feel free to share and you can also pair this with the, NCII has a really great Mathematical Instruction Interventions course that they dropped into the into the chat, that Amy dropped, in terms of mathematics. And in the mathematics course, I know Sarah Powell played a role in that and it's a really great resource for teachers who are adapting their instruction. So, I really highly recommend that.

It looks like we are just running out of time, so I really would like to appreciate, send out my thanks and appreciation to NCII, to our fellow team members at Project STAIR, and especially to you all viewers for attending this webinar. And we really appreciate you taking the time to be with us here today and hopefully you found something useful that you can take it and apply tomorrow to your classrooms and that you can take to your PLC's and talk about and integrate.

Like Rachel said, we hope that you go back and that you watch the previous webinars. And if you have questions or comments, we're really going to continue this conversation about how to implement DBI in the virtual world, so we really hope that you stay in touch, that you continue to contact us with your questions and suggestions because this is really a conversation that I think we're all having. And I think one of the greatest things that we can do is just continue to support one another and you know collaborate with each other as colleagues as much as we can.

Please be on the lookout for additional resources, Facilitator Guides from these presentations that you can take with you to your PLC. And like Rachel said at the beginning of the slide, we also would like to thank the Office for Special Education Programs who is our funder and has made this research program possible. And so, just want to thank you to OSEP. Thank you to the other members of the team at University of Missouri, the University of Texas at Austin and Southern Methodist University. And thank you again for attending this webinar.

Rachel Juergensen: Thank you

Samantha Bos: Thank you guys.